

CARDIOPULMONARY LABORATORY CAREER LADDER AFSCS 90251
AND 90271(U) AIR FORCE OCCUPATIONAL MEASUREMENT CENTER
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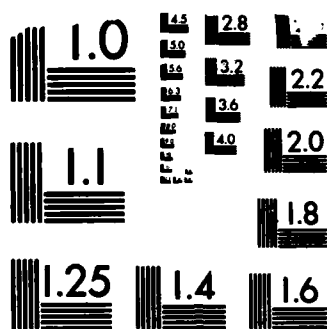
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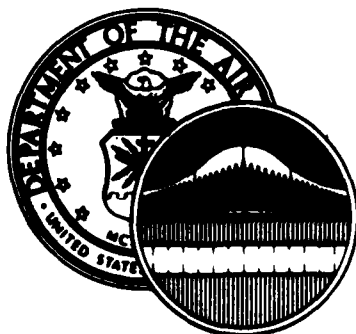
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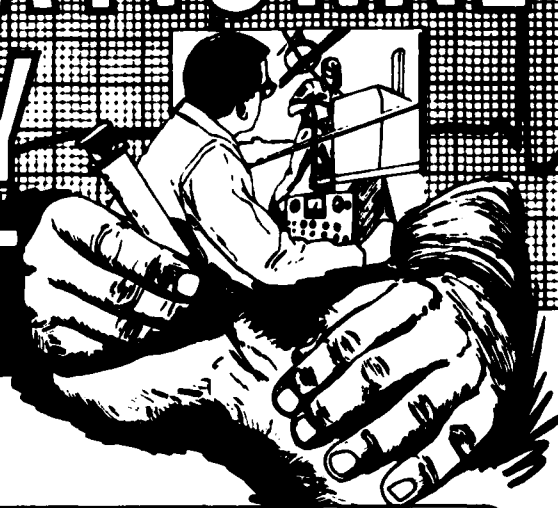


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UNITED STATES AIR FORCE

OCCUPATIONAL SURVEY REPORT



CARDIOPULMONARY LABORATORY CAREER LADDER

AFSCs 90251 AND 90271

AFPT 90-902-482

DECEMBER 1983

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OCCUPATIONAL ANALYSIS PROGRAM
USAF OCCUPATIONAL MEASUREMENT CENTER
AIR TRAINING COMMAND
RANDOLPH AFB, TEXAS 78150

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AFSC 902X1 OSR AND SUPPORTING DOCUMENTS

	<u>OSR</u>	<u>JOB</u> <u>INV</u>	<u>ANL</u> <u>EXT</u>	<u>TNG</u> <u>EXT</u>
AFHRL/MODS	2	6	1m	1m
AFHRL/ID	1	1	1m	1m/1h
AFMEA/MEMD	1	1	1h	1
AFMPC/MPCRPO	2			
ARMY OCCUPATIONAL SURVEY BRANCH	1	1		
CCAF/AYX	1	1		
DEFENSE TECHNICAL INFORMATION CENTER	1	1		
HQ AAC/DPAT	3	3		3
HQ AAC/SGA	1	1		1
HQ AFCC/LGMMT (MAC)	1	1		1
HQ AFCC/SGA	1	1		1
HQ AFISC/DAP	1	1		
HQ AFLC/MPCA	3	3		3
HQ AFLC/SGA	1	1		1
HQ AFMSC/SGP (BROOKS AFB TX)	1			
HQ AFSC/MPAT	3	3		3
HQ AFSC/SGA	1	1		1
HQ ATC/DPAE	1	1		1
HQ ATC/SGHT	2	4	1m	2m/2h
HQ MAC/DPAT	3	3		3
HQ MAC/SGA	1	1		1
HQ PACAF/DPAL	1	1		1
HQ PACAF/DPAT	3	3		3
HQ PACAF/SGA	1	1		1
HQ SAC/DPAT	3	3		3
HQ SAC/LGMQ (ATCLO)	1	1		1
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HQ TAC/DPLATC	1	1		1
HQ TAC/SGA	1	1		1
HQ USAF/SGHP (BOLLING AFB DC)	1	1		1
HQ USAF/MPPT	1	1		1
HQ USAFE/DPAT	3	3		3
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NODAC	1	1		
SHCS/MSO (SHEPPARD AFB TX - MEDICAL)	8	2	1m	7m/1h
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PREFACE

This survey presents the results of a detailed Air Force Occupational Survey of the Cardiopulmonary Laboratory career ladder (902X1). Authority for conducting occupational surveys is contained in AFR 35-2. Computer outputs from which this report was produced are available for use by operating and training officials.

The survey instrument was developed by Mr Michael Bozardt, Inventory Development Specialist. First Lieutenant Carlton F. Middleton, Occupational Analyst, analyzed the data and wrote the final report. Ms Olga Velez provided computer programming support for the project. This report has been reviewed and approved by Lieutenant Colonel Jimmy L. Mitchell, Chief, Airman Career Ladders Analysis Section, Occupational Analysis Branch, USAF Occupational Measurement Center, Randolph AFB, Texas 78150.

Copies of this report are distributed to Air Staff sections, major commands, and other interested training and management personnel. Additional copies may be obtained upon request to the USAF Occupational Measurement Center, attention of the Chief, Occupational Analysis Branch (OMY), Randolph AFB, Texas 78150.

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SUMMARY OF RESULTS

1. Survey Sample: A representative 139 of 174 Cardiopulmonary Laboratory (AFS 902X1) personnel made an 80 percent sample. The sample consisted of 5- and 7-skill level personnel, distributed across appropriate major commands.
2. Specialty Jobs: AFS 902X1 jobs vary around four functions: invasive cardiology, noninvasive cardiology, pulmonary, and respiratory therapy. Personnel assigned to medical centers are more likely to specialize in one of the areas; whereas, personnel not assigned to medical centers may perform a broader range of tasks. Invasive cardiology is highly specialized and usually performed only at medical centers.
3. Comparison of DAFSC 5- and 7-Skill Levels: Since 902X1 personnel are in training until they achieve their 5-skill level, only personnel having a 5- or 7-skill level were surveyed. The 7-skill level job is broader, with additional supervisory responsibilities over the 5-skill level. On technical job performance, the 5- and 7-skill level personnel do not greatly differ.
4. Analysis of AFR 39-1: The 90211/31/51 AFR-39-1 Specialty Job Description could be lengthened with additional tasks and equipment to better represent the 5-skill level job. The 90271 Specialty Description appears to adequately cover the technician's job.
5. Analysis of Training Documents: Both the 902X1 STS and POI need review in light of occupational survey data. One STS item and 16 POI paragraphs need examination by training officials.
6. Analysis of Major Command Differences: Variations in job performance exist among the seven major commands analyzed in this report. Air Force Logistics Command personnel have the broadest job, Air Force Systems Command personnel the narrowest. TAC personnel report the poorest job attitudes.
7. Comparison of 90251 CONUS To Overseas Personnel: Five-skill level personnel assigned overseas have a broader job than their CONUS counterparts. This may be explained by the fact that most CONUS personnel are assigned to medical centers and, consequently, may specialize in an area; whereas, a higher percentage of overseas personnel are assigned to hospitals and regional hospitals where specialization is less likely.
8. Analysis of Job Attitudes: AFS 902X1 personnel report positive job attitudes. Over three-quarters of the personnel sampled indicate plans to reenlist.
9. Implications: The implications of this occupational survey report (OSR) are: (1) AFS 90211/31/51 AFR 39-1 Specialty Job Description needs review for possible expansion, (2) STS 902X1 (dated May 1981, with revisions to October 1982) needs review, and (3) POI J3ABR90231 (dated October 1982) needs review.

OCCUPATIONAL SURVEY REPORT
CARDIOPULMONARY LABORATORY CAREER LADDER
(AFS 902X1)

INTRODUCTION

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This is a report summarizing an analysis of data returned from an occupational survey of the Cardiopulmonary Laboratory career ladder (AFS 902X1). The Occupational Analysis Branch, USAF Occupational Measurement Center, completed this report in response to a request for training evaluation and for comparisons among medical career ladders. This is the first Occupational Survey Report completed for the Cardiopulmonary Laboratory career ladder.

The present AFS 902X1 specialty evolved from the 902X0A Medical Service Specialist, Cardiopulmonary, which began in September 1961. On 30 September 1964, the career ladder name changed to the present "Cardiopulmonary Laboratory" and the numeric designation changed to 902X1. A numeric change to 909X1 followed on 31 December 1965. Another numeric change to 916X0 occurred on 1 July 1968. With the 1 July 1968 numeric change, the Cardiopulmonary specialty acquired a separate 9-skill level, DAFSC 91690. On 30 April 1979, DAFSC 91690 was combined with DAFSC 90292 into DAFSC 90299, which supervises the Cardiopulmonary Laboratory, Medical Service, and Surgical Service Air Force specialties. Since 31 October 1978, CEM Code 90200 has managed these specialties as well. The Cardiopulmonary specialty was converted from a lateral to a standard career ladder, with a numeric change to 902X1 on 30 April 1981.

→ Work in the 902X1 Cardiopulmonary Laboratory specialty centers around three functions: cardiology, pulmonary, and respiratory therapy. Technicians generally rotate among the three areas, with time worked in any single area dependent on factors such as policy, workload, manning, experience of the technicians, and so forth. Some responsibilities of 902X1 personnel include performing cardiopulmonary resuscitation (CPR) during emergencies, preparing and calibrating instrumentation, administering tests, and administering drugs. Invasive cardiology is a highly specialized skill within cardiology.

Technical training in the 902X1 career ladder is carried out in two parts. Phase I is taught at the Technical School (Sheppard AFB) and lasts about 11 weeks; Phase II training is performed at one of several USAF Medical Centers--Wilford Hall, Andrews AFB, Wright-Patterson AFB, Scott AFB, Travis AFB, or Carswell AFB--and lasts 30 weeks. Phase II training uses 902X1 noncommissioned officers (NCOs) assigned to the medical center as instructors, but instructional materials are controlled by the Technical School. Phase II sites typically have two or three students per course. Personnel receive their 5-skill level upon completion of Phase II training.

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SURVEY METHODOLOGY

Inventory Development

Interviews with 26 Cardiopulmonary Laboratory subject-matter specialists at five Air Force Bases, including the School of Health Care Sciences, USAF, at Sheppard Technical Training Center, resulted in the inventory instrument used in this survey (AFPT 90-902-482). Technical School officials reviewed and validated the final inventory. The 902X1 inventory contained 321 tasks under 11 duty headings. The inventory also included an extensive background section requesting information such as:

Organizational assignment level
Work schedule
Job title
Areas worked in
Equipment used or operated

Survey Administration

In late 1982, consolidated base personnel offices (CBPOs) in operational units worldwide administered the job inventory to incumbents holding DAFSCs 90251 or 90271. Since 3-skill level personnel are still in Phase II training, they were not included. In addition, DAFSCs 90299 and 90200 personnel were not included due to the broad nature of their multi-specialty responsibilities. Personnel surveyed were selected from a computer-generated mailing list obtained from personnel data tapes maintained by the Air Force Human Resources Laboratory (AFHRL).

Each respondent who completed a job inventory first completed an identification and biographical information section and then checked all tasks performed in his or her present job. Those tasks checked were then rated on a 9-point scale showing the relative amount of time spent on that task as compared to all other tasks checked. The ratings ranged from one (very small amount of time spent) to nine (very large amount of time spent), with a rating of five representing an average amount of time spent in performing a task.

To determine the relative amount of time spent on each task checked by a respondent, all of the incumbent's ratings are assumed to account for 100 percent of his or her time spent on the job. These ratings are totaled and each task rating is then divided by the total task ratings, with the resulting quotient multiplied by 100. This procedure provides a basis for comparing all tasks in terms of both percent members performing and relative percent time spent.

Data Processing and Analysis

Once job inventories are returned from the field, they are visually checked to ensure proper completion and to eliminate any that are obviously misprepared. Then both task and background data from inventories are entered into the AFHRL computer to form a complete case record for each respondent. From this data, computer products are generated and analyzed in a variety of ways. This analysis forms the basis for this report.

Survey Sample

When the AFS 902X1 inventory development began in 1982, the career field had 254 incumbents. With career fields as small as this, the entire specialty is usually surveyed. Only 5- and 7- skill level personnel in the specialty who had over six weeks in the AFSC and on the job were surveyed. One hundred thirty-nine inventories were returned out of a career field total of 175 eligible 5- and 7-skill level personnel, for an 80 percent sample. Table 1 presents the paygrade distribution of the survey sample. Tables 2 and 3 present the Time in Career Field (TICF) and Major Command (MAJCOM) sample distributions. All three tables show good sample representation of the career ladder population.

Task Factor Administration

In addition to completing a Job Inventory booklet, selected senior 902X1 personnel also completed an additional booklet for either task difficulty (TD) or training emphasis (TE) ratings. These booklets are processed separately from the job inventories; they consist of a background section for demographic information and a full task list. Ratings on these booklets are used in a number of different analyses discussed in more detail within the report. Table 4 presents the Command representation of TD and TE raters.

Task Difficulty. Thirty-eight senior NCOs rated all of 902X1 tasks on a 9-point scale from extremely low to extremely high difficulty, with difficulty defined as the length of time it takes an average incumbent to learn to do the task. Ratings were then adjusted so tasks of average difficulty reflect a rating of 5.00, with a standard deviation of 1.0.

Task difficulty data were analyzed to determine if these senior technicians had similar opinions as to the relative difficulty of the 321 tasks. The interrater reliability (as assessed through components of variance of standard group means) of .95 for these raters reflected very high agreement. These data resulted in a rank ordering of tasks from the highest to lowest in difficulty.

Job Difficulty Index (JDI). After computing a task difficulty value for each task item, it was then possible to compute a Job Difficulty Index (JDI) for the groups identified in the survey analysis. This index provides a relative measure of which jobs, when compared to other jobs identified, were more or less difficult. An equation using the number of tasks performed and the average difficulty per unit time spent (ADPUTS) as variables was the basis for the JDI. The index ranges from one, for very easy jobs, to 25 for very

difficult jobs. The indices were adjusted so the average job difficulty index is 13.00. Thus, the more time a group spends on difficult tasks, and the more tasks they perform, the higher their job difficulty index.

Training Emphasis. Individuals completing training emphasis booklets were asked to rate all of the tasks on a 10-point scale from no training required to extremely heavy training required. This data was used to calculate a rank ordering of tasks indicating where the emphasis should be placed on structured training for first-term personnel. Structured training was defined as training provided at resident technical schools, Field Training Detachments (FTD), Mobile Training Teams (MTT), formal OJT, or by any other organized training method.

Training emphasis data were collected from a separate sample of 38 experienced 7-skill level personnel stationed worldwide. The interrater reliability (as assessed through components of variance of standard group means) for these raters was .96, indicating extremely high agreement among raters as to which tasks required some form of structured training and which did not. In this specialty, tasks rated high in training emphasis have average ratings of 6.33 or above, and these tasks need to be considered carefully to ensure that they are included in some type of formal training.

When used in conjunction with other factors, such as percent members performing, the task difficulty and training emphasis ratings provide insight into training requirements. The information these ratings provide can help improve both training and overall career ladder management.

Training Documents

Occupational survey data are very useful for examining the currency of Specialty Training Standards (STSs) and Plans of Instruction (POIs). These data can indicate areas of an STS or POI that should be reviewed for additions or deletions based on percentage of members performing, task factor data, and other information developed by training managers.

To assist in the STS and POI analysis, subject-matter specialists (SMSs) at the technical school compare the job inventory task list with the STSs and POIs. Then, they provide a written match of the inventory tasks to the STS or POI item(s) best covering each task (i.e., the field requirement for which the training is provided). Tasks that fit under no present STS or POI item are left unmatched.

Based on this matching, computer products are generated that assist in analyzing the training documents in accordance with ATCR 52-22. Because survey data is only one of many inputs into training decisions, the result of this training analysis is a recommendation of STS or POI items for review by training officials.

Since training and other career field documents (AFR 39-1) are affected by how a specialty is organized and how personnel are being utilized, examination of the jobs of career ladder incumbents, based on their task performance, is essential. The SPECIALTY JOBS analysis provides this perspective.

TABLE 1
PAYGRADE DISTRIBUTION OF SURVEY SAMPLE

<u>PAYGRADE</u>	<u>PERCENT OF ASSIGNED*</u>	<u>PERCENT OF SAMPLE</u>
E-4	11	7
E-5	46	48
E-6	28	30
E-7	13	14
OTHER	<u>2</u>	<u>1</u>
TOTAL	100	100

TOTAL ASSIGNED: 254
 TOTAL ELIGIBLE: 174
 TOTAL IN SAMPLE: 139
 PERCENT OF ASSIGNED IN SAMPLE: 55%
 PERCENT OF ELIGIBLE IN SAMPLE: 80%

* MANNING FIGURES AS OF OCTOBER 1982

TABLE 2
TICF DISTRIBUTION OF SURVEY SAMPLE

<u>TICF (MONTHS)</u>	<u>NUMBER IN SAMPLE</u>	<u>PERCENT OF SAMPLE</u>
1-48	59	43
49-96	41	29
97-144	32	23
145-192	6	4
193-244	1	1

TABLE 3
MAJCOM REPRESENTATION OF SURVEY SAMPLE

<u>MAJCOM</u>	<u>PERCENT OF ASSIGNED*</u>	<u>PERCENT OF SAMPLE</u>
MAC	25	26
AFSC	24	22
ATC	18	15
TAC	10	10
SAC	9	11
AFLC	5	5
PACAF	3	4
USAFE	2	3
AAC	1	2
OTHER	<u>3</u>	<u>2</u>
TOTAL	100	100

* MANNING FIGURES AS OF OCTOBER 1982

TABLE 4

MAJCOM DISTRIBUTION OF TASK DIFFICULTY AND
TRAINING EMPHASIS RATERS

<u>MAJCOM</u>	<u>PERCENT OF ASSIGNED</u>	<u>PERCENT OF TASK DIFFICULTY RATERS</u>	<u>PERCENT OF TRAINING EMPHASIS RATERS</u>
MAC	25	32	24
AFSC	24	21	18
ATC	18	8	12
TAC	10	10	21
SAC	9	18	8
AFLC	5	5	5
PACAF	3	3	8
USAFE	2	3	2
AAC	1	-	-
OTHER	<u>3</u>	<u>-</u>	<u>2</u>
TOTAL	100	100	100

SPECIALTY JOBS (Career Ladder Structure)

Within most career ladders, there are usually a number of different jobs performed. The jobs may differ due to different tasks being performed, varying amounts of time spent performing the tasks, or the number of tasks the incumbents perform. Background variables, such as major work area, job title, major command, and so on, usually correlate with differences in task performance and help to explain why the differences exist.

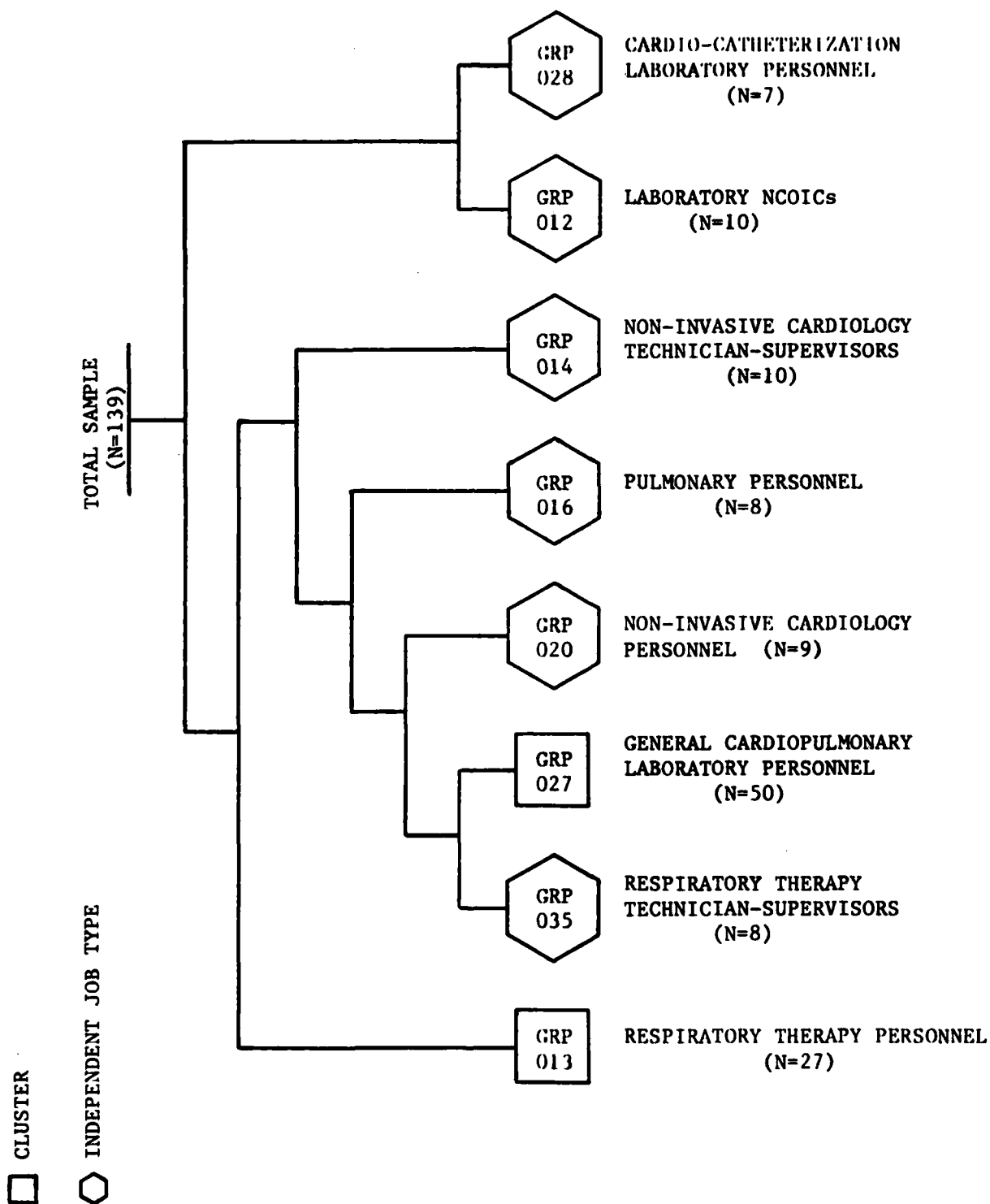
To identify the different jobs being performed, the survey responses of job incumbents are input into a computer which mathematically computes a resulting hierarchical clustering of the returns, based on a comparison of the tasks performed and the similarity of relative time spent on tasks performed. Subsequently, a diagram is drawn which reflects individuals who have similar task performance. These groups are compared to one another and the natural job structure is identified for the career ladder.

Analysis of the 902X1 career ladder structure identified two clusters (larger groups of respondents with similar job performance) and six independent job types (smaller groups of respondents who report distinct jobs). Four main functional areas of technical job performance emerged: (1) Non-invasive cardiovascular, (2) Invasive cardiovascular, (3) Respiratory Therapy, and (4) Pulmonary. AFS 902X1 jobs differed in the degree of their concentration in each of these areas, as well as other nontechnical duty areas.

Listed below are the jobs identified. The group (GRP) numbers shown beside each title refer to the corresponding groups on computer printed information. The letter N stands for the number of personnel in the group.

- I. RESPIRATORY THERAPY PERSONNEL CLUSTER (GRP013, N=27)
- II. RESPIRATORY THERAPY TECHNICIAN-SUPERVISORS (GRP035, N=8)
- III. GENERAL CARDIOPULMONARY LABORATORY PERSONNEL CLUSTER
(GRP027, N=50)
- IV. NON-INVASIVE CARDIOLOGY PERSONNEL (GRP020, N=9)
- V. PULMONARY PERSONNEL (GRP016, N=8)
- VI. NON-INVASIVE CARDIOLOGY TECHNICIAN-SUPERVISORS
(GRP014, N=10)
- VII. LABORATORY NCOICs (GRP012, N=10)
- VIII. CARDIO-CATHETERIZATION LABORATORY PERSONNEL
(GRP028, N=7)

FIGURE 1
902X1 CAREER LADDER STRUCTURE



Ninety-three percent of the respondents in the survey sample grouped within the jobs listed above. The remaining seven percent perform tasks or task combinations too dissimilar to fall within any of these categorizations.

Group Descriptions

The following paragraphs contain brief job descriptions of the clusters and independent job types identified through the career ladder structure analysis. Figure 1 shows how these groups related to one another on the cluster-merger diagram used in analysis. Several tables, following the narrative of this section, provide comparative data on the job groups. Table 5 shows the percent time spent on duties, Table 6 provides background information, Table 7 presents job attitudes, Table 8 reveals some differences in specific task performance, and Table 9 shows equipment utilization by the job groups. Appendix A, following the IMPLICATIONS Section of this report, presents lists of the tasks most representative of each job group.

I. RESPIRATORY THERAPY PERSONNEL CLUSTER (GRP013). The 27 members forming this cluster specialize in performing respiratory therapy. They spend 51 percent of their job time performing tasks that are specific to respiratory therapy (see Table 5). Respiratory Therapy Personnel have the most limited job identified, performing an average of only 50 tasks. Because of this limited nature, they also have the least difficult job identified, JDI=8.2 (see Table 6). Table 8 further confirms the specialized job performance of Respiratory Therapy Personnel, with respiratory therapy tasks being the only tasks listed that are performed by a majority of the group members. Table A1 in Appendix A provides a more thorough listing of representative tasks for this group.

Eighty-nine percent of the Respiratory Therapy Personnel report assignment to a Medical Center (see Table 6). This is consistent with the limited nature of their job, since medical centers are large and better able to use assigned 902X1 personnel in specialized functions. The Respiratory Therapy Personnel are also the second most junior group identified, with an average Time in Career Field (TICF) of 54 months. Table 9 reveals the equipment utilization of the Respiratory Therapy Personnel; as indicated, members of this group mainly utilize respiratory equipment.

II. RESPIRATORY THERAPY TECHNICIAN-SUPERVISORS (GRP035). Eight respondents formed this job. Members of this group perform the technical tasks of respiratory therapy; but in addition, they perform many supervisory, managerial, and administrative tasks. As Table 5 illustrates, they spend 25 percent of their job time performing respiratory therapy, 35 percent performing tasks in the supervisory and managerial duties (A through D), and 15 percent performing administrative or materiel procedures. As Table 8 reveals, members of this group perform some tasks that few other job group's members perform. Naturally, supervising 90251 personnel is one of the tasks; the only other group to perform this task to a substantial degree is the group of Non-invasive Cardiology Technician-Supervisors. The most

distinguishing task identified for the Respiratory Therapy Technician-Supervisors is "Perform pretreatment evaluation of respiratory therapy patients". All of them perform this task; whereas, the only other group with a majority of members performing the task, the Cardiopulmonary Laboratory Personnel, have only 58 percent of their members performing it. The Respiratory Therapy Technician-Supervisors perform the second broadest job in the field, averaging the performance of 115 tasks. Table A2 in Appendix A provides a listing of representative tasks performed. This group has the most difficult job identified, with a JDI of 16.3 (see Table 6).

Respiratory Therapy Technician-Supervisors average 56 months TICF. As was the case with Respiratory Therapy Personnel, most members of this group are assigned to a Medical Center. Expectedly, Respiratory Therapy Technician-Supervisors most utilize equipment associated with Respiratory Therapy (see Table 9).

Both the Respiratory Therapy Personnel and Respiratory Therapy Technician-Supervisors are assigned mainly to Medical Centers and perform a specialized job. In contrast, the General Cardiopulmonary Laboratory Personnel perform a broader job.

III. GENERAL CARDIOPULMONARY LABORATORY PERSONNEL (GRP027). The 50 members forming this group comprise the largest job group in the career ladder. They have a diverse job, reporting performance of an average of 148 tasks in the areas of non-invasive cardiology, pulmonary, and respiratory therapy. Table 5 highlights their diversity, with their job time spread among all duties except that of performing Invasive Cardiology Procedures. Table 8 reiterates this diversity, showing task performance in several areas. This is also illustrated by their wide utilization of equipment (see Table 9). Due to the broad nature of their job, they have the second most difficult job identified, with a JDI of 16.0.

As indicated in Table 6, only 32 percent of the General Cardiopulmonary Laboratory Personnel are assigned to medical centers. This helps to explain the diversity of the job, since hospitals and regional hospitals have fewer 902X1 personnel assigned and specialization in a single cardiopulmonary area would not be efficient use of available personnel. In line with assignments at hospitals and regional hospitals, this is the only group identified with members assigned overseas; 24 percent of the group report an assignment overseas.

Within the General Cardiopulmonary Laboratory Personnel cluster, two job variations were identified. One subgroup had 19 members, many of whom indicated a job title of NCOIC. This subgroup reported assignments at hospitals and medical centers. They performed technical as well as supervisory and managerial tasks, with most members reporting a 7-skill level DAFSC. Another subgroup identified consisted of 25 members who reported assignments at regional hospitals. Their job centered on technical performance, with members reporting both 5- and 7-skill level DAFSCs.

IV. NON-INVASIVE CARDIOLOGY PERSONNEL (GRP020). This group of nine reports a job limited mainly to the performance of non-invasive cardiology functions. Thirty-six percent of their job time is spent on this duty (see Table 5). Administrative and materiel functions account for an additional 17 percent of their job time. Members of this group perform an average of 75 tasks. Their JDI of 9.5 is the second-lowest identified.

Sixty-seven percent of the Non-invasive Cardiology Personnel report assignments at a regional hospital. Usually, specialization in a single cardiopulmonary area occurs at medical centers, but not at regional hospitals. In the case of Non-invasive Cardiology Personnel, their job is not highly specialized. Fourteen percent of their job time is also spent in respiratory therapy, and pulmonary procedures account for an additional four percent. The previously discussed Cardiopulmonary Laboratory Personnel job group (40 percent of whom are assigned to regional hospitals) probably covers this function at the regional hospitals. Thus, members of the Non-invasive Cardiology Personnel job group perform several functions, but concentrate their job performance in non-invasive cardiology. Members report the lowest time in the career ladder of any group identified, with an average TICF of only 45 months (see Table 6).

V. PULMONARY PERSONNEL (GRP016). The eight members forming this group spend 32 percent of their job time performing pulmonary laboratory procedures. In addition, nine percent of their job time is spent training (see Table 5). On the average, Pulmonary Personnel perform only 71 tasks (see Table 6). As illustrated in Table 8, pulmonary laboratory procedure tasks performed by members of this group clearly differentiate them from the members of any of the other identified job groups. Also, performing vector-cardiography procedures seems to be limited to members of this group only. Table 9 predictably reveals that most equipment utilized by members of this group is limited to pulmonary functions.

Eighty-eight percent of the members of this group are assigned to a medical center (see Table 6). Members report an average TICF of 77 months and only 38 percent report supervising other personnel.

VI. NON-INVASIVE CARDIOLOGY TECHNICIAN-SUPERVISORS (GRP014). Consisting of 10 members, this group performs technical non-invasive cardiology functions, consuming 36 percent of their job time, and performs supervisory and managerial duties which consume 32 percent of their job time (see Table 5). Table 8 highlights the tasks which help differentiate this job group from the others. Predictably, these tasks center in the areas of non-invasive cardiology and supervision. In addition, members of this group are almost the only performers of these two tasks: "Assess and report to physician vectorcardiogram test results" and "Make entries on local echocardiographic record forms." This group also sets up X-ray equipment, which is a task frequently performed by only one other group: the Cardio-Catheterization Laboratory Personnel. As illustrated in Table 9, Non-invasive Cardiology Technician-Supervisors predictably utilize much of the cardiology laboratory equipment.

Members of this group average 93 months TICF (see Table 6). Members report assignments to medical centers, clinics, and regional hospitals. Seventy percent of the group report supervising other personnel.

VII. LABORATORY NCOICs (GRP012). Comprised of 10 people, this group performs a supervisory and managerial job. Eighty-four percent of their job time is spent performing these nontechnical duties: Organizing and Planning, Directing and Implementing, Inspecting and Evaluating, Training, and Performing Administrative or Materiel Procedures (see Table 5). Members perform an average of 77 tasks. Table 8 shows that the tasks differentiating this group are supervisory and managerial in nature. As indicated in Table 9, not much equipment is heavily utilized by Laboratory NCOICs, probably due to the nontechnical nature of their job. Though nontechnical in nature and limited in scope, their job contains the tasks rated most difficult by career ladder personnel; this is illustrated by the ATDPUTS rating of 5.4 for this job.

Laboratory NCOICs have the highest average TICF (126 months) of any job group identified. All members have a 7-skill level DAFSC (see Table 6) and the average grade is E-7. Ninety percent of the members are assigned to a medical center. Laboratory NCOICs are equally divided, having 50 percent in Air Force Systems Command and 50 percent in the Military Airlift Command.

The final job group identified in the 902X1 career ladder structure analysis, the Cardio-Catheterization Laboratory Personnel, report a unique and specialized job.

VIII. CARDIO-CATHETERIZATION LABORATORY PERSONNEL (GRP028). Numbering seven, respondents comprising this group perform tasks specific to the cardio-catheterization laboratory. These tasks fall under the duty of Performing Invasive Cardiovascular Procedures. This duty accounts for 32 percent of the job time of this group (see Table 5). Supervisory and managerial duties are also performed, as are administrative and non-invasive cardiology duties. The group clearly emerges with the differentiating tasks listed in Table 8. The utilization of catheters by 80 percent of group members also clearly distinguishes this group (see Table 9).

Seventy-one percent of the Cardio-catheterization Laboratory Personnel report a 7-skill level DAFSC (see Table 6). Seventy-two percent are assigned to a medical center; additionally, 43 percent are in Air Force Systems Command. Their average TICF is 77 months.

Comparison of Job Groups

In addition to describing the jobs of the specialty, it is often useful to contrast information about the different jobs to further highlight their similarities and their differences. Tables 5 through 9 summarize various types of information about the job types described above; these data displays facilitate comparisons among the job types.

In terms of the varying difficulty of the jobs in the specialty, refer to line 4 in Table 6. Respiratory Therapy Personnel have the lowest Job Difficulty Index (JDI=8.2); note that they perform a limited job (average number of tasks = 50) and have a low Average Task Difficulty Per Unit Time Spent (ATDPUTS).

By way of contrast, the Respiratory Therapy Technician-Supervisors group has the most difficult job (JDI=16.3; average number of tasks = 115; and ATDPUTS = 5.0). In addition to performing their technical work, members of this group are mostly supervisors (bottom line of Table 6; 63 percent supervise others) and spend more time than some of the other groups in Directing and Implementing, Inspecting and Evaluating, and Training (see Table 5).

Cardiopulmonary Laboratory Personnel (JDI=16.0) and Laboratory NCOICs (JDI=15.7) also have relatively difficult jobs. While the NCOICs perform only about the average number of tasks, the tasks they do perform are somewhat more difficult (ATDPUTS = 5.4).

Table 7 presents the job groups identified in the career ladder structure analysis, along with their respective responses on several standard attitudinal questions. The majority of respondents in all groups found their job interesting. Non-invasive Cardiology Personnel, however, had only 56 percent of their members indicating so (two members in that group did not respond to the question). Perhaps due to the limited nature of their job, only 52 percent of the Respiratory Therapy Personnel felt their talents were well utilized; in line with this, only 48 percent felt their job utilized their training and only 44 percent were satisfied with their sense of accomplishment. Correspondingly, the Non-invasive Cardiology Personnel had only 57 percent feeling their job utilized their training. Reenlistment intentions were high for all groups except the Respiratory Therapy Technician-Supervisors (only 68 percent planned to reenlist) and the Laboratory NCOICs (only 60 percent planned to reenlist).

Summary

Eight jobs emerged in the analysis of the 902X1 career ladder structure. These jobs varied as to the degree of concentration in the 902X1 functional areas of respiratory therapy, non-invasive cardiology, invasive cardiology, and pulmonary. Groups were found specializing in each of these areas, with one group of individuals performing tasks in all areas but invasive cardiology. In addition, one group of NCOICs were found performing a predominantly supervisory job. Specialization seems to occur most at the larger medical centers; clinics, hospitals, and regional hospitals require broader task performance since they have fewer assigned 902X1 personnel.

Job attitudes vary among the job groups, but generally, groups report positive feelings about their job. The majority of members of all the groups plan to reenlist.

TABLE 5
PERCENT TIME SPENT PERFORMING DUTIES BY JOB GROUPS

DUTIES	RESPIRATORY THERAPY PERSONNEL (N=27)	RESPIRATORY THERAPY TECHNICIAN- SUPERVISORS (N=8)	GENERAL CARDIOPULMONARY LABORATORY PERSONNEL (N=50)	NON-INVASIVE CARDIOLOGY PERSONNEL (N=9)	PULMONARY PERSONNEL (N=8)	NON-INVASIVE CARDIOLOGY TECHNICIAN- SUPERVISORS (N=10)	LABORATORY NCOICs (N=10)	CARDIO- CATHETERIZATION LABORATORY PERSONNEL (N=7)
A ORGANIZING AND PLANNING	1	7	5	1	3	9	17	5
B DIRECTING AND IMPLEMENTING	1	10	4	1	3	7	17	4
C INSPECTING AND EVALUATING	1	9	4	*	3	6	16	2
D TRAINING	2	9	4	1	9	10	23	4
E PERFORMING ADMINISTRATIVE OR MATERIEL PROCEDURES	9	15	14	17	17	12	11	13
F PERFORMING TASKS COMMON TO RESPIRATORY THERAPY, PULMONARY, OR CARDIOVASCULAR FUNCTIONS	18	13	16	19	26	12	6	25
G PERFORMING INVASIVE CARDIOVASCULAR PROCEDURES	2	*	1	2	*	6	3	32
H PERFORMING NON-INVASIVE CARDIO- VASCULAR FUNCTIONS	2	1	16	36	*	36	3	9
I PERFORMING PULMONARY LABORATORY PROCEDURES	*	2	10	4	32	*	*	1
J PERFORMING RESPIRATORY THERAPY	51	25	20	14	4	1	3	2
K PERFORMING MAINTENANCE AND CLEANING OF CARDIOPULMONARY EQUIPMENT	13	9	6	5	3	1	1	3

* LESS THAN ONE PERCENT TIME SPENT PERFORMING THESE DUTIES

TABLE 6
BACKGROUND INFORMATION FOR 902X1 JOB GROUPS

	RESPIRATORY THERAPY PERSONNEL (GRP018)	RESPIRATORY THERAPY TECHNICIAN- SUPERVISORS (GRP035)	GENERAL CARDIO-PULMONARY LABORATORY PERSONNEL (GRP027)	NON-INVASIVE CARDIOLOGY PERSONNEL (GRP020)	PULMONARY PERSONNEL (GRP016)	NON-INVASIVE CARDIOLOGY TECHNICIAN- SUPERVISORS (GRP014)	LABORATORY NCOICs (GRP012)	CARDIO- CATHETERIZATION LABORATORY PERSONNEL (GRP028)
NUMBER OF PERSONNEL IN JOB GROUP:	27	8	50	9	8	10	10	7
AVERAGE NUMBER OF TASKS PERFORMED:	50	115	148	75	71	106	77	74
PERCENT LOCATED OVERSEAS:	0%	0%	24%	0%	0%	0%	0%	0%
AVERAGE PAYGRADE:	E-5	E-6	E-5/6	E-5	E-5/6	E-6	E-7	E-5/6
AVERAGE MONTHS TICT:	54	56	67	45	92	93	126	77
DUTY AIR FORCE SPECIALTY CODE:	90251	38%	38%	44%	50%	30%	0%	29%
	90271	26%	62%	56%	50%	70%	100%	71%
MAJOR COMMAND:	USAFE	0%	8%	0%	0%	0%	0%	0%
	AFLC	0%	8%	0%	0%	20%	0%	0%
	AFSC	37%	13%	22%	25%	20%	50%	43%
	ATC	22%	13%	11%	25%	20%	0%	29%
	MAC	37%	37%	34%	38%	30%	50%	14%
	PACAF	0%	0%	0%	0%	0%	0%	0%
	SAC	0%	12%	22%	12%	10%	0%	0%
	TAC	4%	12%	11%	0%	0%	0%	0%
	OTHER	0%	0%	0%	0%	0%	0%	14%

TABLE 6 (CONTINUED)

BACKGROUND INFORMATION FOR 902X1 JOB GROUPS

ORGANIZATIONAL LEVEL:	RESPIRATORY THERAPY PERSONNEL (GRP018)		RESPIRATORY THERAPY TECHNICIAN-SUPERVISORS (GRP035)		GENERAL CARDIOPULMONARY LABORATORY PERSONNEL (GRP027)		NON-INVASIVE CARDIOLOGY PERSONNEL (GRP020)		PULMONARY PERSONNEL (GRP016)		NON-INVASIVE CARDIOLOGY TECHNICIAN-SUPERVISORS (GRP014)		LABORATORY NCOICs (GRP012)		CARDIO-CATHETERIZATION LABORATORY PERSONNEL (GRP028)
	CLINIC HOSPITAL	HOSPITAL MEDICAL CENTER	REGIONAL HOSPITAL												
	4%	13%	4%	0%	0%	0%	0%	0%	0%	0%	20%	10%	14%		
	0%	12%	24%	0%	0%	0%	0%	0%	0%	0%	0%	0%	14%		
	89%	63%	32%	33%	67%	12%	88%	50%	12%	30%	90%	72%	0%		
	7%	12%	40%	67%											
PERCENT SUPERVISING OTHERS:															
JOB DIFFICULTY INDEX (JDI):	19%	63%	46%	11%	38%	70%	70%	70%	38%	12.2	15.1	15.7	29%		
AVERAGE TASK DIFFICULTY PER UNIT	8.2	16.3	16.0	9.5									13.1		
TIME SPENT (ATDPUTS):	4.8	5.0	4.8	4.6	5.0	5.0	5.0	5.0	5.0	5.4	5.4	5.1			

TABLE 7
JOB ATTITUDES FOR 902X1 JOB GROUPS

	RESPIRATORY THERAPY PERSONNEL (N=27)		RESPIRATORY THERAPY TECHNICIAN-SUPERVISORS (N=8)		GENERAL CARDIO-PULMONARY LABORATORY PERSONNEL (N=50)		NON-INVASIVE CARDIOLOGY PERSONNEL (N=9)		PULMONARY PERSONNEL (N=8)		NON-INVASIVE CARDIOLOGY TECHNICIAN-SUPERVISORS (N=10)		LABORATORY NCOICs (N=10)		CARDIO-CATHETERIZATION LABORATORY PERSONNEL (N=7)	
I FIND MY JOB:																
DULL	15		13		10		11		0		0		0		0	
SO-SO	15		0		8		11		0		0		0		0	
INTERESTING	70		87		82		56		100		100		90		100	
MY JOB UTILIZES MY TALENTS:																
NOT AT ALL OR VERY LITTLE	48		25		22		0		13		0		10		0	
FAIRLY WELL OR BETTER	52		75		78		89		87		100		90		100	
MY JOB UTILIZES MY TRAINING:																
NOT AT ALL OR VERY LITTLE	48		13		16		22		13		10		10		0	
FAIRLY WELL OR BETTER	48		87		84		57		87		90		90		100	
WITH SENSE OF ACCOMPLISHMENT, I AM:																
DISSATISFIED	44		13		20		11		0		0		0		0	
AMBIVALENT	7		12		4		11		13		10		0		0	
SATISFIED	44		75		76		67		87		90		90		100	
I PLAN TO REENLIST:																
NO, I WILL RETIRE	7		13		12		0		0		0		10		14	
NO, OR PROBABLY NO	11		12		20		0		0		0		30		14	
YES, OR PROBABLY YES	82		75		68		89		100		90		60		71	

NOTE: COLUMNS MAY NOT ADD TO 100 PERCENT DUE TO NO RESPONSE BY SOME SURVEY RESPONDENTS.

TABLE 8

TASKS WHICH DIFFERENTIATE JOB GROUPS
(PERCENT MEMBERS PERFORMING)

TASKS	RESPIRATORY THERAPY PERSONNEL (N=27)	RESPIRATORY THERAPY TECHNICIAN- SUPERVISORS (N=8)	GENERAL CARDIOPULMONARY LABORATORY PERSONNEL (N=50)	NON-INVASIVE CARDIOLOGY PERSONNEL (N=9)	PULMONARY PERSONNEL (N=8)	NON-INVASIVE CARDIOLOGY TECHNICIAN- SUPERVISORS (N=10)	LABORATORY NCOICs (N=10)	CARDIO- CATHETERIZATION LABORATORY PERSONNEL (N=7)
J307 SET UP STANDARD HUMIDIFIERS	96	88	86	33	13	10	20	14
J308 SET UP STANDARD NEBULIZERS	96	88	90	44	13	0	12	20
J299 PERFORM SUCTIONING PROCEDURES	81	75	78	22	13	0	10	14
1267 PERFORM ROUTINE SPIROMETRY	0	25	98	56	100	0	0	0
J290 OBTAIN SPUTUM COLLECTIONS	33	75	84	44	0	0	0	0
E109 MAKE ENTRIES ON LOCAL PULMONARY REQUEST FORMS	4	13	92	78	88	0	10	0
J296 PERFORM PRETREATMENT EVALUATION OF RESPIRATORY THERAPY PATIENTS	37	100	58	0	0	0	0	0
J300 RECORD PROGRESS OF RESPIRATORY THERAPY TREATMENT	59	100	78	22	0	0	20	0
B34 SUPERVISE CARDIOPULMONARY LABORA- TORY SPECIALISTS (AFSC 90251)	15	88	46	11	13	80	30	14
F155 PREPARE PATIENTS FOR TREADMILL TESTS	4	13	82	100	25	80	0	29
H229 PREPARE PATIENTS FOR ECGs	11	13	88	100	0	90	10	29
E111 MAKE ENTRIES ON LOCAL TREADMILL REPORT FORMS	4	13	92	100	25	90	10	29
1245 CALCULATE RESULTS OF LUNG DIFFUSION TESTS	4	56	0	11	100	0	0	0
1271 SET UP LUNG DIFFUSION EQUIPMENT	0	0	56	22	100	0	0	0
1261 PERFORM LUNG DIFFUSION TESTS	0	0	66	22	100	0	0	0
E105 MAKE ENTRIES ON LOCAL ECG/CARDIO- GRAPHIC RECORD FORMS	0	0	66	44	13	100	10	14
H214 INSTRUCT PATIENTS IN VECTOR- CARDIOGRAPHY PROCEDURES	0	0	16	11	80	80	0	0

TABLE 8 (CONTINUED)

TASKS WHICH DIFFERENTIATE JOB GROUPS
(PERCENT MEMBERS PERFORMING)

TASKS	RESPIRATORY THERAPY PERSONNEL (N=27)	RESPIRATORY TECHNICIAN- SUPERVISORS (N=8)	GENERAL CARDIOPULMONARY LABORATORY PERSONNEL (N=50)	NON-INVASIVE CARDIOLOGY PERSONNEL (N=9)	PULMONARY PERSONNEL (N=8)	NON-INVASIVE CARDIOLOGY TECHNICIAN- SUPERVISORS (N=10)	LABORATORY MCOICs (N=10)	CARDIO- CATHETERIZATION LABORATORY PERSONNEL (N=7)
H198 ASSESS AND REPORT TO PHYSICIAN VECTOCARDIOGRAM TEST RESULTS	0	0	16	11	0	80	0	14
A2 ASSIGN SPONSORS FOR NEWLY ASSIGNED PERSONNEL	0	13	32	11	0	20	100	14
A6 DEVELOP ORGANIZATIONAL CHARTS	0	38	28	0	0	10	80	0
C42 EVALUATE INDIVIDUALS FOR PROMOTION, DEMOTION, OR RECLASSIFICATION	0	63	36	0	13	60	90	0
F166 SET UP X-RAY EQUIPMENT	0	0	10	0	0	80	20	100
G177 COMPLETE LOCAL PROTOCOL FORMS FOR CATHETERIZATION PROCEDURES	0	0	6	0	0	30	10	100
G180 INSTRUCT PATIENTS IN CATHETERI- ZATION PROCEDURES	0	0	6	11	0	30	10	100

TABLE 9
EQUIPMENT UTILIZATION BY JOB GROUPS
(PERCENT MEMBERS RESPONDING)

EQUIPMENT	RESPIRATORY THERAPY PERSONNEL (N=27)	RESPIRATORY THERAPY TECHNICIAN- SUPERVISORS (N=8)	GENERAL CARDIO-PULMONARY LABORATORY PERSONNEL (N=50)	NON-INVASIVE CARDIOLOGY PERSONNEL (N=9)	PULMONARY PERSONNEL (N=8)	NON-INVASIVE CARDIOLOGY TECHNICIAN- SUPERVISORS (N=10)	LABORATORY NCOICs (N=10)	CARDIO- CATHETERIZATION LABORATORY PERSONNEL (N=7)
APEX AND PHONOCARDIOGRAPHY SYSTEMS	4	0	36	44	0	90	10	29
CARDIAC OUTPUT RECORDERS	19	0	16	11	0	30	20	100
DECMRITER	0	0	20	22	38	20	10	43
DOPPLER SYSTEMS	7	13	14	0	0	50	0	71
ECHOCARDIOGRAPHY SYSTEMS (N-MODE)	7	0	70	78	0	100	20	14
ECHOCARDIOGRAPHY SYSTEMS (TWO- DIMENSIONAL)	4	0	34	67	0	90	20	14
ELECTROCARDIOGRAPHIC MACHINES	19	0	90	100	25	100	50	71
GREEN DYE EQUIPMENT	0	0	0	0	0	20	10	86
HEMOGLOBIN DEVICES	15	25	18	22	38	0	0	0
HOLTER MONITOR EQUIPMENT EXCEPT SCANNERS	4	0	72	78	13	100	20	29
HOLTER MONITOR SCANNERS	4	0	60	67	0	100	10	29
IMAGE INTENSIFIERS	0	0	8	0	0	40	10	86
MULTICHANNEL RECORDERS WITH TAPE RECORDERS	7	13	28	11	13	50	40	71
OSCILLOSCOPES	11	13	46	33	50	40	20	100
PACEMAKER PROGRAMMERS	4	0	8	11	0	60	20	71
PACEMAKERS	0	0	20	22	0	70	30	86
PATIENT ROTATOR OR POSITIONERS	0	0	0	0	0	10	10	100
POWER DYE INJECTORS	0	0	2	0	0	20	10	86
SPECIALIZED TRANSDUCERS AND SIGNAL CONDITIONERS	26	25	26	0	0	40	30	86
THERMOMILLUTION EQUIPMENT	7	13	2	0	0	40	20	100
VECTOCARDIOGRAPH SYSTEMS	4	13	20	56	0	80	10	14
VIDEOTAPE RECORDERS	4	13	28	22	38	70	40	100

NOTE: EQUIPMENT LISTED ON THIS PAGE IS GENERALLY FOUND ONLY IN CARDIOLOGY LABORATORIES

TABLE 9 (CONTINUED)
EQUIPMENT UTILIZATION BY JOB GROUPS
(PERCENT MEMBERS RESPONDING)

EQUIPMENT		TYPICAL LOCATION																	
		C = CARDIOLOGY		RESPIRATORY THERAPY (N=27)		RESPIRATORY THERAPY TECHNICIAN-SUPERVISORS (N=8)		GENERAL CARDIO-PULMONARY LABORATORY PERSONNEL (N=50)		NON-INVASIVE CARDIOLOGY PERSONNEL (N=9)		PULMONARY PERSONNEL (N=8)		NON-INVASIVE CARDIOLOGY TECHNICIAN-SUPERVISORS (N=10)		LABORATORY NCOICs (N=10)		CARDIO-CATHERIZATION LABORATORY PERSONNEL (N=7)	
		CA = CATH LAB	P = PULMONARY	RT = RESPIRATORY THERAPY	RESPIRATORY THERAPY PERSONNEL	RESPIRATORY THERAPY SUPERVISORS	RESPIRATORY THERAPY TECHNICIAN-SUPERVISORS	GENERAL CARDIO-PULMONARY LABORATORY PERSONNEL	NON-INVASIVE CARDIOLOGY PERSONNEL	PULMONARY PERSONNEL	NON-INVASIVE CARDIOLOGY TECHNICIAN-SUPERVISORS	LABORATORY NCOICs	CARDIO-CATHERIZATION LABORATORY PERSONNEL						
BLOOD GAS ANALYZERS					74	88		90	78	100	20	70	43						
CAMERAS					15	13		18	22	38	50	0	100						
PEDAL ERGOMETERS					4	0		12	11	0	40	20	57						
SHUNT DETECTION DEVICES					7	0		6	0	13	30	10	71						
SINGLE OR MULTIPLE CHANNEL PHYSIOLOGICAL RECORDING SYSTEMS					30	25		30	11	13	40	30	100						
TREADMILLS					7	13		92	89	63	80	30	29						
X-RAY FLUOROSCOPY UNITS					4	0		8	11	25	40	10	100						
BODY PLETHYSMOGRAPHS					4	0		14	22	75	0	20	0						
COMPUTERIZED PULMONARY FUNCTION ANALYZERS					7	13		68	56	100	0	20	0						
DIFFUSING CAPACITY MEASUREMENT SYSTEMS					7	0		64	56	100	0	20	0						
FIBER OPTIC BRONCHOSCOPES					33	63		28	56	25	10	30	14						
PNEUMOTACHOGRAPHS					4	13		22	11	63	10	10	0						
SPIROMETERS					48	75		96	67	87	10	30	14						
TOMOMETERS					4	0		8	11	38	0	20	0						
X-Y RECORDERS					0	0		34	0	38	60	10	43						
BAROMETERS	P,RT				41	50		66	44	50	20	50	0						
COMPRESSORS	P,RT				56	100		88	78	63	20	30	57						
CO OXIMETERS	P,RT				33	63		20	44	75	20	20	29						

TABLE 9 (CONTINUED)
EQUIPMENT UTILIZATION BY JOB GROUPS
(PERCENT MEMBERS RESPONDING)

EQUIPMENT	TYPICAL LOCATION									
	C = CARDIOLOGY CA = CATH LAB P = PULMONARY RT = RESPIRATORY THERAPY	RESPIRATORY THERAPY PERSONNEL (N=27)	RESPIRATORY THERAPY TECHNICIAN-SUPERVISORS (N=8)	GENERAL CARDIO-PULMONARY LABORATORY PERSONNEL (N=50)	NON-INVASIVE CARDIOLOGY PERSONNEL (N=9)	PULMONARY PERSONNEL (N=8)	NON-INVASIVE CARDIOLOGY TECHNICIAN-SUPERVISORS (N=10)	LABORATORY NCOICs (N=10)	CARDIO-CATHETERIZATION LABORATORY PERSONNEL (N=7)	
GAS ANALYZERS, OTHER THAN BLOOD GAS ANALYZERS	RT	37	25	44	33	50	0	20	14	
HAND-HELD NEBULIZERS	RT	93	100	98	89	75	10	30	29	
INCENTIVE SPIROMETER DEVICES	RT	82	100	92	67	25	10	30	14	
OXYGEN BLENDERS	RT	78	75	80	78	0	0	30	14	
RESPIROMETERS	RT	67	63	88	11	38	0	20	14	
SUCTION MACHINES	RT	63	63	76	33	0	30	40	100	
ULTRASONIC NEBULIZERS	RT	52	50	80	44	0	0	10	14	
VENTILATORS	RT	82	88	96	78	38	10	30	43	
CATHETERS	CA	15	0	10	11	0	30	20	86	
CALCULATORS	ALL	63	88	92	89	100	90	60	100	
COMPUTER TERMINALS	ALL	26	13	58	33	38	60	60	100	
DEFIBRILLATORS	ALL	30	63	96	100	63	60	40	100	
OXIMETERS	ALL	19	38	22	22	38	20	10	86	
PROGRAMMABLE COMPUTERS	ALL	22	38	48	11	50	40	40	100	
PROJECTORS	ALL	8	38	26	11	13	50	50	100	
TRAINING AIDS	ALL	11	63	52	33	50	70	40	43	
TEND CHART RECORDERS	ALL	11	25	16	22	13	30	20	14	
TYPEWRITERS	ALL	41	88	82	56	75	80	60	100	

COMPARISON OF 5- AND 7-SKILL LEVEL DAFSC GROUPS

As indicated in the introductory portion of this report, only persons with a 5- or 7-skill level Duty Air Force Specialty Code (DAFSC) participated in the AFS 902X1 survey. Consequently, analysis of DAFSC groups must be limited to a comparison of the 5-skill level to the 7-skill level.

In general, the differences in the jobs performed by DAFSC 90251 versus DAFSC 90271 personnel center around supervisory and managerial functions. The 7-skill level personnel perform much the same technical job as the 5-skill level personnel; however, the 7-skill level technicians have additional responsibilities supervising and managing (see Table 10). This is confirmed by the fact that the 7-skill level job is broader with an average performance of 107 tasks as compared to 87 tasks for the 5-skill level group. Table 11 presents differences in the utilization of equipment for the two groups; as indicated, most differences are slight.

Table 12 illustrates the differences in jobs performed by 5- and 7-skill level respondents. Respiratory Therapy personnel have a high concentration of 5-skill level personnel, probably due to the comparatively limited nature of this job (average performance of only 50 tasks). Seven-skill level personnel are more concentrated in the broader job of General Cardiopulmonary Laboratory Personnel (average performance of 148 tasks). In addition, the Laboratory NCOICs are all 7-skill levels, and the specialized Cardio-catheterization Laboratory Personnel job has a high concentration of 7-skill level personnel.

In line with their broader job, 7-skill level personnel have a more difficult job with a JDI of 14.2 compared to 11.5 for the 5-skill levels (see Table 13). A higher percentage of 5-skill level personnel report assignments overseas (17 percent versus 7 percent for the 7-skill levels). Concerning major command assignments, the largest difference lies in Air Force Systems Command, where 29 percent of the 5-skill levels are assigned, as opposed to 17 percent of the 7-skill levels personnel. A slightly higher percentage of 5-skill level personnel are also assigned to medical centers (see Table 13). In line with the task performance differences in supervisory tasks, 55 percent of the 7-skill level group report supervising others, compared to only 19 percent of the 5-skill level group.

In conclusion, 5- and 7-skill level personnel perform similar technical jobs, with the 7-skill level group having additional responsibilities in supervisory and managerial areas. This is evident in the job group distribution of the skill-levels, with the 7-skill level personnel being more evident in the job groups having a broader task performance.

TABLE 10

TASKS WHICH BEST DIFFERENTIATE BETWEEN 5-SKILL AND 7-SKILL LEVEL PERSONNEL
(PERCENT MEMBERS PERFORMING)

TASKS	DAFSC 90251 (N=62)	DAFSC 90271 (N=77)	DIFFERENCE
A3 COORDINATE WORK ACTIVITIES WITH OTHER SECTIONS	34	78	-44
A19 SCHEDULE LEAVES OR PASSES	13	52	-39
A4 DETERMINE REQUIREMENTS FOR SPACE, PERSONNEL, EQUIPMENT, OR SUPPLIES	27	65	-38
A9 ESTABLISH ORGANIZATIONAL POLICIES, OFFICE OR LABORATORY INSTRUCTIONS, OR STANDING OPERATING PROCEDURES (SOP)	32	69	-37
B30 INTERPRET POLICIES, DIRECTIVES, OR PROCEDURES FOR SUBORDINATES	21	57	-36
A1 ASSIGN PERSONNEL TO DUTY POSITIONS	13	47	-34
C53 INDORSE AIRMAN PERFORMANCE REPORTS (APR)	6	40	-34
A5 DETERMINE WORK PRIORITIES	42	74	-32
B24 DIRECT UTILIZATION OF EQUIPMENT	31	63	-32
B21 COUNSEL PERSONNEL ON PERSONAL OR MILITARY-RELATED PROBLEMS	24	56	-32
C39 ANALYZE WORK LOAD REQUIREMENTS	21	52	-31
C42 EVALUATE INDIVIDUALS FOR PROMOTION, DEMOTION, OR RECLASSIFICATION	11	41	-30
A10 ESTABLISH PERFORMANCE STANDARDS FOR SUBORDINATES	15	43	-28
C41 EVALUATE COMPLIANCE WITH PERFORMANCE STANDARDS	20	47	-27
C55 PREPARE APRs	27	55	-27
E86 COORDINATE PURCHASE OF SPECIAL EQUIPMENT OR MEDICAL SUPPLIES WITH MEDICAL MATERIEL PERSONNEL OR VENDORS	26	52	-26
F167 TAKE AND RECORD BLOOD PRESSURES	48	74	-26
C52 EVALUATE WORK SCHEDULES	16	41	-25

TABLE 11
EQUIPMENT USED BY 902X1 DAFSC GROUPS
(PERCENT RESPONDING)

<u>EQUIPMENT</u>	<u>DAFSC 90251 (N=62)</u>	<u>DAFSC 90271 (N=77)</u>
APEX AND PHONOCARDIOGRAPHY SYSTEMS	19	30
BAROMETERS	47	48
BLOOD GAS ANALYZERS	77	75
BODY PLETHYSMOGRAPHS	11	14
CALCULATORS	76	87
CAMERAS	19	26
CARDIAC OUTPUT RECORDERS	18	20
CATHETERS	11	18
COMPRESSORS	68	66
COMPUTERIZED PULMONARY FUNCTION ANALYZERS	32	46
COMPUTER TERMINALS	42	53
CO OXIMETERS	27	31
DECWRITER	13	20
DEFIBRILLATORS	58	81
DIFFUSING CAPACITY MEASUREMENT SYSTEMS	29	43
DOPPLER SYSTEMS	10	18
ECHOCARDIOGRAPHY SYSTEMS (M-MODE)	34	48
ECHOCARDIOGRAPHY SYSTEMS (TWO-DIMENSIONAL)	19	31
ELECTROCARDIOGRAPHIC MACHINES	52	74
FIBER OPTIC BRONCHOSCOPES	24	33
GAS ANALYZERS, OTHER THAN BLOOD GAS ANALYZERS	42	25
GREEN DYE EQUIPMENT	3	9
HAND HELD NEBULIZERS	84	71
HEMOGLOBIN DEVICES	21	9
HOLTER MONITOR EQUIPMENT EXCEPT SCANNERS	36	53
HOLTER MONITOR SCANNERS	31	44
IMAGE INTENSIFIERS	7	14
INCENTIVE SPIROMETER DEVICES	71	62
MULTICHANNEL RECORDERS WITH TAPE RECORDERS	21	30
OSCILLOSCOPES	35	36
OXIMETERS	26	22
OXYGEN BLENDERS	71	49
PACEMAKER PROGRAMMERS	5	21
PACEMAKERS	15	25
PATIENT ROTATOR OR POSITIONERS	3	9
PEPAL ERGOMETERS	8	17
PNEUMOTACHOGRAPHS	15	16
POWER DYE INJECTORS	3	10
PROGRAMMABLE COMPUTERS	44	38
PROJECTORS	21	31
RESPIROMETERS	60	51

TABLE 11 (CONTINUED)

EQUIPMENT USED BY 902X1 DAFSC GROUPS
(PERCENT RESPONDING)

<u>EQUIPMENT</u>	<u>DAFSC 90251 (N=62)</u>	<u>DAFSC 90271 (N=77)</u>
SHUNT DETECTION DEVICES	11	10
SINGLE OR MULTIPLE CHANNEL PHYSIOLOGICAL RECORDING SYSTEMS	27	31
SPECIALIZED TRANSDUCERS AND SIGNAL CONDITIONERS	26	26
SPIROMETERS	63	66
SUCTION MACHINES	55	58
THERMODILUTION EQUIPMENT	10	14
TONOMETERS	5	10
TRAINING AIDS	40	40
TREADMILLS	48	66
TREND CHART RECORDERS	15	18
TYPEWRITERS	61	75
ULTRASONIC NEBULIZERS	50	48
VECTORCARDIOGRAPH SYSTEMS	13	25
VENTILATORS	73	70
VIDEOTAPE RECORDERS	21	34
X-RAY FLUOROSCOPY UNITS	13	16
X-Y RECORDERS	19	25

TABLE 12
DISTRIBUTION OF DAFSC GROUPS WITHIN JOB GROUPS*

<u>JOB GROUP</u>	<u>DAFSC 90251</u>	<u>DAFSC 90271</u>
RESPIRATORY THERAPY PERSONNEL (GRP013)	20	7
RESPIRATORY THERAPY TECHNICIAN-SUPERVISORS (GRP035)	3	5
GENERAL CARDIOPULMONARY LABORATORY PERSONNEL (GRP027)	19	31
NONINVASIVE CARDIOLOGY PERSONNEL (GRP020)	4	5
PULMONARY PERSONNEL (GRP016)	4	4
NONINVASIVE CARDIOLOGY TECHNICIAN-SUPERVISORS (GRP014)	3	7
LABORATORY NCOICs (GRP012)	0	10
CARDIO-CATHETERIZATION LABORATORY PERSONNEL (GRP028)	2	5

* NUMBER OF MEMBERS

TABLE 13

BACKGROUND COMPARISON OF 5-AND 7-SKILL LEVELS

	DAFSC 90251 (N=62)	DAFSC 90271 (N=77)
AVERAGE NUMBER OF TASKS PERFORMED	87	107
PERCENT LOCATED OVERSEAS	13%	7%
JOB DIFFICULTY INDEX (JDI)	11.5	14.2
AVERAGE TASK DIFFICULTY PER UNIT TIME SPENT (ATDPUTS)	4.8	4.9
AVERAGE PAYGRADE	E-5	E-6
MAJOR COMMAND		
USAFE	5%	1%
AFLC	3%	7%
AFSC	29%	17%
ATC	14%	14%
MAC	24%	27%
PACAF	3%	4%
SAC	8%	13%
TAC	10%	10%
OTHER	4%	7%
AVERAGE MONTHS TAFMS	114	160
ORGANIZATIONAL LEVEL		
CLINIC	8%	7%
HOSPITAL	8%	14%
MEDICAL CENTER	63%	51%
REGIONAL HOSPITAL	21%	29%
PERCENT SUPERVISING OTHERS	19%	55%

ANALYSIS OF AFR 39-1 SPECIALTY JOB DESCRIPTIONS

Examination of the AFR 39-1 Specialty Job Descriptions for DAFSC 90251 and DAFSC 90271 revealed that the 5-skill level description could be expanded based on occupational survey data. Presently, the two job descriptions read very differently; however, analysis of tasks performed indicates that the main difference between the 5- and 7-skill level jobs centers around additional supervisory responsibilities for the 7-skill level personnel. In technical areas, jobs performed are similar.

DAFSC 90251/31/11 Specialty Description (dated 1 Jan 82). This specialty description possibly could be lengthened. No specific mention is made of equipment, such as electrocardiographic machines, compressors, or nebulizers, but these frequently are utilized by 5-skill level personnel. Slide rules, on the other hand, are listed but probably seldom used (not included in the USAF Job Inventory since none of the technicians interviewed reported its use). Including some additional tasks and equipment utilized in the field might aid this description in better portraying the scope of the DAFSC 90251 job. Tables 10 and 11 in the comparison of 5- and 7-skill level DAFSC groups section list equipment and examples of the tasks performed by 5-skill level personnel.

DAFSC 90271 Specialty Job Description (dated 1 Jan 1982). The 7-skill level description is more comprehensive than the 1-/3-/5-skill level description. Including both technical and supervisory responsibilities, the 7-skill level job description covers a wide the range of 90271 responsibilities. No changes are recommended.

ANALYSIS OF 902X1 TRAINING DOCUMENTS

One of the most useful applications of occupational survey data is the examination of career ladder training documents. Career ladder training officials examine the USAF Job Inventory and compare tasks within the inventory to the Specialty Training Standard (STS) and Plan of Instruction (POI) looking for items and paragraphs which involve training required to perform the task(s). This results in a matching of STS and POI items with inventory tasks. Thus, the STS or POI can then be assessed by examining the percentage of career ladder personnel performing the tasks matched to the items and the task difficulty and training emphasis ratings of the tasks.

ATC Regulation 52-22 provides guidelines for examining Specialty Training Standards (STS) and Plans of Instruction (POI). For initial skills training, first-job (1-24 months) or first-enlistment (1-48 months) groups are examined. Since Air Force career first-termers were not available (had not progressed to the 5-skill level) in this career ladder sample at the time of this survey, the 1-48 month time in career field (TICF) group was used instead as the most appropriate "target" group for initial skill training. If 50 percent or more of the group perform a task, the ABR Course should provide performance training to minimize on-the-job training (OJT) requirements. If 30 to 49 percent perform a task, background or subject-matter knowledge should be provided in the ABR Course. Tasks with 29 percent or fewer members performing normally are not trained in the ABR Course. For the STS analysis, 5- and 7- skill level groups are examined. Areas having tasks matched with less than 10 percent members performing are identified for review. These percent-performing criteria are moderated by task difficulty, training emphasis, task criticality, and subject-matter specialists' judgment at Utilization and Training (U&T) workshops. Training emphasis may justify inclusion of training even if percent members performing is low. Finally, the expertise of subject-matter specialists who attend U&T workshops is needed to predict changes and refine STS and POI statements.

STS 902X1 (May 1981). Only one STS item was identified for review. Table 14 reveals that item 12A(6)(c) has less than 10 percent of 5-skill level and of 7-skill level personnel performing related matched tasks. Training emphasis is moderate for the task assigned to this item as well.

In addition to the item recommended for review, several tasks were not matched to the STS, but had a high percentage of members performing them and at least moderate training emphasis. Table 15 lists these tasks, the percentage of 5- and 7-skill level personnel performing them, and their respective training emphasis and task difficulty ratings. These tasks may need to be added to the STS the next time this document is revised.

POI J3ABR90231 (October 1982). Since few airmen in their first-enlistment were available in the sample (had not yet progressed to the 5-skill level), the POI was examined using the task performance data of personnel who had been in the career field for less than 49 months. This group's job performance should be indicative of personnel who have recently completed 902X1 basic training. Those items with matched tasks having less than 30 percent of the 1-48 month TICF personnel performing them are recommended for review.

Sixteen POI paragraphs fit the criteria for review. Table 16 lists each POI paragraph recommended for review, along with the most-performed task matched to that paragraph. As indicated, none of these areas have matched tasks with over 30 percent of the groups performing them. Other tasks not listed may be matched to any given paragraph, but none have a higher percentage of members performing them.

Table 17 provides the tasks not referenced to the POI which have over 30 percent of the 1-24 or 1-48 month TICF personnel performing them and above average training emphasis. As indicated, only nine tasks fit these criteria. Some of these tasks may be inappropriate for resident training (serve as receptionist, etc.) but may be adequately covered in Phase II training. All should be reviewed to insure that they are trained.

In summary, the 902X1 STS has one item in need of review and POI J3ABR90231 has 16 paragraphs needing review based on occupational survey data. Twelve tasks unmatched to the STS need review for possible inclusion in the present document or expansion of the STS to include them. Similarly, nine tasks unmatched to the POI need review for inclusion in the present plan or for possible expansion of the POI to include them.

TABLE 14

AFS 902X1 STS ITEM RECOMMENDED FOR REVIEW

STS ITEMS	PROFICIENCY CODES		TRAINING EMPHASIS*	PERCENT MEMBERS PERFORMING		TASK DIFFICULTY**
	SKILL LEVEL	DAFSC		DAFSC		
	3- 5- 7-	90251 (N=62)	90271 (N=77)			
12A(6)(C)	A 2B 3C					
TEST CARDIAC STRESS ON MASTER'S TEST						
H224			3.21	7%	7%	
PERFORM MASTER'S TEST					3.96	

* TRAINING EMPHASIS: MEAN = 3.86, HIGH TE = 5.98

** TASK DIFFICULTY: MEAN = 5.00, HIGH TD = 6.00

TABLE 15

TASKS* NOT REFERENCED TO THE 902X1 STS

TASKS	TRAINING EMPHASIS	PERCENT MEMBERS PERFORMING		TASK DIFFICULTY
		DAFSC 90251	DAFSC 90271	
K316 INSPECT CARDIOPULMONARY EQUIPMENT	6.24	65	69	4.54
K313 CHANGE RESPIRATORY EQUIPMENT COMPONENTS	5.92	68	55	4.46
J290 OBTAIN SPUTUM COLLECTIONS	5.37	48	42	3.97
P141 DISPOSE OF CONTAMINATED MATERIALS	5.18	39	47	4.00
J294 PERFORM EXTUBATION PROCEDURES	5.16	27	17	4.91
G170 APPLY DIRECT PRESSURE TO CATHETERIZATION INJECTION SITES	4.87	7	13	3.78
J293 PERFORM CHEST PHYSIOTHERAPY	4.58	32	16	4.66
K314 CLEAN PATIENT TREATMENT ROOMS USING ASEPTIC TECHNIQUES	4.58	26	31	3.92
G192 START INTRAVENOUS INFUSIONS	4.34	13	16	5.89
J297 PERFORM ROUTINE TRACHEOSTOMY CARE	4.21	11	5	4.52
M199 ASSIST PHYSICIAN IN CARDIAC REHABILITATION PROGRAM	3.95	13	13	5.26
E127 PERFORM RECEPTIONIST FUNCTIONS, SUCH AS ANSWERING PHONE AND RECEIVING PATIENTS	3.90	69	83	3.36

* TASKS LISTED ARE THOSE WITH ABOVE AVERAGE TRAINING EMPHASIS RATINGS AND OVER 10 PERCENT OF EITHER 5- OR 7-SKILL LEVEL PERSONNEL PERFORMING THEM

TABLE 16

POI J3ABR90231 PARAGRAPHS IDENTIFIED FOR REVIEW

PARAGRAPHS	TRAINING EMPHASIS	PERCENT MEMBERS PERFORMING		TASK DIFFICULTY
		1-24 MONTHS TICF* (N=21)	1-48 MONTHS TICF* (N=59)	
I6A DESCRIBE PROCEDURES FOR ORDERING AIR FORCE AND COMMERCIAL PUBLICATIONS				
A11 ESTABLISH PUBLICATION LIBRARIES	.45	5	9	5.12
I6B IDENTIFY THE PROPER METHOD FOR MAINTAINING AIR FORCE PUBLICATIONS				
A11 ESTABLISH PUBLICATION LIBRARIES	.45	5	9	5.12
I12B GIVEN A STERILE PACK AND TRAYS, PERFORM ASEPTIC TECHNIQUES FOR MAINTAINING STERILITY OF EQUIPMENT AND SUPPLIES IN THE CARDIOPULMONARY LABORATORY WITH ASSISTANCE AS REQUIRED TO CORRECTLY DO ALL STEPS OF THE PROCESS PER CHECKLIST J3ABR90231 000-1-12A				
G190 SET UP STERILE FIELD	5.95	14	19	5.05
IV4B DEFINE RADIO NUCLIDE STUDIES (2)				
G174 ASSIST PHYSICIAN IN THALLIUM STUDIES	5.26	10	12	5.82
IV4D DESCRIBE MASTER'S CARDIAC STRESS TESTS (2)				
H224 PERFORM MASTER'S TEST	3.21	5	7	3.96
IV4E DESCRIBE PEDAL ERGOMETRY STRESS TESTS (2)				
F154 PREPARE PATIENTS FOR PEDAL ERGOMETER TESTS	3.76	10	10	4.27
IV4H IDENTIFY BASIC PROCEDURES FOR OPERATING TRANSDUCERS AND SIGNAL CONDITIONS (1)				
G179 CONNECT TRANSDUCERS TO SWAN-GANZ CATHETERS	5.08	10	20	5.15

* TICF = TIME IN CAREER FIELD

TABLE 16 (CONTINUED)

POI J3ABR90231 PARAGRAPHS IDENTIFIED FOR REVIEW

PARAGRAPHS	TRAINING EMPHASIS	PERCENT MEMBERS PERFORMING		TASK DIFFICULTY
		1-24 MONTHS TICF* (N=21)	1-48 MONTHS TICF* (N=59)	
IV4I H228	4.58	24	22	4.58
EXPLAIN THE METHODS OF RECORDING APEX/PHONOCARDIOGRAPHY (2) PREPARE PATIENTS FOR APEX AND PHONOCARDIOGRAMS				
IV4J				
IDENTIFY PROCEDURES FOR CALCULATING DATA FROM APEX/PHONO- CARDIOGRAPHY (2)				
H194				
ASSESS AND REPORT TO PHYSICIAN APEX AND PHONOCARDIOGRAM TEST RESULTS				
IV4L H227	4.53	19	19	6.08
IDENTIFY BASIC STEPS INVOLVED IN VECTORCARDIOGRAPHY (4) PERFORM VECTORCARDIOGRAMS				
IV5B	4.63	5	12	5.68
IDENTIFY THE FUNCTION OF CARDIAC OUTPUT DEVICES, SHUNT DETECTION DEVICES, POWER DYE INJECTORS, VIDEO TAPE RECORDERS, BLOOD GAS ANALYSERS, OXIMETERS, X-RAY FLUOROSCOPY UNITS, AND DOPPLER SYSTEMS, DURING CARDIAC CATHETERIZATION				
F151	5.63	24	27	5.23
F165	3.92	10	27	4.85
PERFORM CO OXIMETER TESTS SET UP VIDEO EQUIPMENT				
IV7B				
PROVIDED THE NECESSARY EQUIPMENT, LIST OF PROCEDURES, AND SIMULATED PATIENT, PERFORM A MAXIMUM VOLUNTARY VENTILATION TEST WITH ASSISTANCE AS REQUIRED TO CORRECTLY PERFORM ALL STEPS OF THE TEST PER CHECKLIST J3ABR90231 (4) SET UP X-Y RECORDERS				
I272	5.00	14	12	5.11
IV7D				
IDENTIFY THE USES OF GAS ANALYSIS IN COLLECTING DATA FOR PULMONARY FUNCTION STUDIES (8) PERFORM HELIUM DILUTION TESTS				
I259	5.82	29	24	5.56

* TICF = TIME IN CAREER FIELD

TABLE 16 (CONTINUED)

POI J3ABR90231 PARAGRAPHS IDENTIFIED FOR REVIEW

PARAGRAPHS	TRAINING EMPHASIS	PERCENT MEMBERS PERFORMING		TASK DIFFICULTY
		1-24 MONTHS TICF* (N=21)	1-48 MONTHS TICF* (N=59)	
IV7F I259	DESCRIBE PROCEDURES FOR OPERATING RESIDUAL VOLUME UNIT (2) PERFORM HELIUM DILUTION TESTS	5.82	29	24 5.56
IV7H	IDENTIFY BASIC PROCEDURES INVOLVED IN PERFORMING BODY PLETHYSMOGRAPHS (2)			
I255	PERFORM BODY PLETHYSMOGRAPH TESTS	5.63	10	10 6.06
F134	CALCULATE RESULTS OF AIRWAY RESISTENCE TESTS	5.61	24	22 6.23
VI1F G172	DESCRIBE PROCEDURES FOR OPERATING A PACEMAKER (1) ASSIST PHYSICIAN IN INSERTION OF TEMPORARY CARDIAC PACEMAKERS	4.76	14	15 6.60

* TICF = TIME IN CAREER FIELD

TABLE 17

TASKS NOT REFERENCED TO POI J3ABR90231*

TASKS	TRAINING EMPHASIS	PERCENT MEMBERS PERFORMING		TASK DIFFICULTY
		1-24 MONTHS TICF** (N=21)	1-48 MONTHS TICF** (N=59)	
F153 PREPARE MEDICATIONS	6.74	67	64	5.47
J276 ASSIST PHYSICIAN IN INTUBATION PROCEDURES	6.11	43	44	5.42
J286 INSTRUCT PATIENTS IN USE OF HAND-HELD OR UPDRAFT NEBULIZERS	5.76	91	73	3.57
J284 INSTRUCT PATIENT WITH USE OF INTERMITTENT POSITIVE PRESSURE BREATHING (IPPB) DEVICES	5.21	52	53	4.12
F141 DISPOSE OF CONTAMINATED MATERIALS	5.18	43	46	4.00
F157 SET UP EMERGENCY DRUG TRAYS	5.13	43	29	5.37
K314 CLEAN PATIENT TREATMENT ROOMS USING ASEPTIC TECHNIQUES	4.58	33	31	3.92
E126 OPERATE COMPUTER TERMINAL	4.11	43	39	5.58
E127 PERFORM RECEPTIONIST FUNCTIONS, SUCH AS ANSWERING PHONE AND RECEIVING PATIENTS	3.90	81	71	3.36

* ONLY TASKS MEETING ATCR 52-22 REQUIREMENTS FOR INCLUSION IN BASIC TRAINING ARE LISTED

** TICF = TIME IN CAREER FIELD

COMPARISON OF 902X1 MAJOR COMMANDS

In some career ladders, the job performed by incumbents may vary with major command (MAJCOM). This variation may be due to utilization policies, different equipment, or any number of additional reasons. These differences can impact assignments, classification, and training. Occupational survey data provide an excellent means of identifying MAJCOM variations.

In the 902X1 career ladder, seven major commands had five or more respondents in the survey sample (generally, a sample group with under five members is deemed too small to examine); those commands are: Military Airlift Command (MAC) with 36 members, Air Force Systems Command (AFSC) with 31 respondents, Air Training Command (ATC) numbering 20, Strategic Air Command (SAC) with 15, Tactical Air Command (TAC) with 14 members, Air Force Logistics Command (AFLC) having seven, and Pacific Air Forces (PACAF) with five. Comparison indicated noticeable variations in the 902X1 job among major commands.

As Table 18 reveals, the breadth of the jobs performed varied from the narrow AFSC job of 65 tasks to the broad AFLC job comprising 177 tasks. PACAF had the second broadest job, with an average performance of 138 tasks. Both AFLC and PACAF personnel performed more supervision than the other MAJCOMs, which could account for their greater breadth. The majority of respondents in AFLC, PACAF, AFSC, and MAC reported assignments to medical centers. SAC and TAC, on the other hand, had most members assigned to regional hospitals; whereas, members of ATC reported diverse assignments. AFLC personnel had the highest experience level, with members reporting an average TICF of 85 months.

As Table 19 illustrates, some differences were found in the percent of time spent on duties by major command groups. SAC, TAC, and PACAF usually do not perform invasive cardiology procedures. Table 20 presents some specific tasks which indicate some of the differences in job performance. Broad, clear functional differences were rare for the major commands. Most differences in job performance for the major commands can probably be traced to the organizational assignment level characteristic of members of that MAJCOM.

Analysis of job attitudes revealed that TAC members are least satisfied with their jobs (see Table 18). They have the lowest satisfaction on all of the indicators except reenlistment intentions. SAC reports the lowest reenlistment intentions (60 percent); in addition, only 67 percent find their job interesting. All commands, except MAC, AFLC, and PACAF, report around 65 percent finding their training well utilized. MAC, AFLC, and PACAF report all-around more positive job attitudes.

In summary, AFS 902X1 MAJCOM groups have some differences in jobs performed. These differences may stem from the organizational assignment level characteristic of the MAJCOM; jobs differ with assignments to medical centers, hospitals, and other units. AFLC personnel report the broadest job, with a substantial number of members indicating that they supervise. TAC reports negative job attitudes in general, and personnel in several MAJCOMs find their training poorly utilized.

TABLE 18

BACKGROUND INFORMATION BY 902X1 MAJCOM GROUPS

	MAC (N=36)	AFSC (N=31)	ATC (N=20)	SAC (N=15)	TAC (N=14)	AFLC (N=7)	PACAF (N=5)
AVERAGE NUMBER OF TASKS PERFORMED	99	65	82	97	111	177	138
JOB DIFFICULTY INDEX (JDI)	13.9	10.8	11.4	12.7	13.0	18.8	15.3
AVERAGE TASK DIFFICULTY PER UNIT TIME SPENT (ATDPUTS)	5.0	5.0	4.8	4.8	4.7	5.0	4.7
AVERAGE PAYGRADE	E-5/6	E-5/6	E-5/6	E-5/6	E-5/6	E-5/6	E-5/6
DUTY AIR FORCE SPECIALTY CODE							
90251	42%	58%	45%	33%	43%	29%	40%
90271	58%	42%	55%	67%	57%	71%	60%
AVERAGE MONTHS TAFMS	78	74	52	58	65	85	62
ORGANIZATIONAL LEVEL							
CLINIC	0%	13%	15%	0%	7%	14%	0%
HOSPITAL	0%	3%	15%	7%	36%	14%	0%
MEDICAL CENTER	94%	77%	50%	0%	0%	71%	80%
REGIONAL HOSPITAL	6%	7%	20%	93%	57%	0%	20%
PERCENT SUPERVISING OTHERS	31%	36%	35%	47%	36%	71%	60%
JOB ATTITUDES							
FIND JOB INTERESTING	83%	87%	85%	67%	57%	100%	100%
FEEL TALENTS AT LEAST FAIRLY WELL UTILIZED	89%	77%	70%	73%	43%	100%	80%
FEEL TRAINING AT LEAST FAIRLY WELL UTILIZED	92%	67%	65%	67%	50%	100%	100%
SATISFIED WITH SENSE OF ACCOMPLISHMENT	78%	77%	55%	80%	43%	100%	80%
PLAN TO REENLIST	75%	87%	75%	60%	79%	71%	80%

TABLE 19

PERCENT TIME SPENT ON DUTIES BY MAJOR COMMANDS

DUTIES	MAC	AFSC	ATC	SAC	TAC	AFLC	PACAF
A. ORGANIZING AND PLANNING	6%	5%	4%	8%	4%	6%	3%
B. DIRECTING AND IMPLEMENTING	6%	5%	4%	4%	4%	5%	3%
C. INSPECTING AND EVALUATING	5%	5%	3%	4%	4%	4%	3%
D. TRAINING	8%	8%	3%	3%	3%	6%	2%
E. PERFORMING ADMINISTRATIVE OR MATERIAL PROCEDURES	12%	11%	13%	18%	16%	9%	13%
F. PERFORMING TASKS COMMON TO RESPIRATORY THERAPY, PULMONARY, OR CARDIO-VASCULAR FUNCTIONS	16%	14%	16%	16%	26%	20%	15%
G. PERFORMING INVASIVE CARDIO-VASCULAR PROCEDURES	2%	7%	5%	*	*	6%	*
H. PERFORMING NON-INVASIVE CARDIO-VASCULAR FUNCTIONS	10%	17%	18%	19%	9%	12%	17%
I. PERFORMING PULMONARY LABORATORY PROCEDURES	6%	3%	6%	7%	7%	10%	9%
J. PERFORMING RESPIRATORY THERAPY	22%	19%	22%	17%	20%	17%	26%
K. PERFORMING MAINTENANCE AND CLEANING OR CARDIOPULMONARY EQUIPMENT	7%	6%	6%	4%	7%	5%	8%

* LESS THAN ONE PERCENT

TABLE 20

TASKS WHICH BEST DIFFERENTIATE 902X1 MAJCOM GROUPS
(PERCENT MEMBERS PERFORMING)

TASKS	MAC (N=36)	AFSC (N=31)	ATC (N=20)	SAC (N=15)	TAC (N=14)	AFLC (N=7)	PACAF (N=5)
I265 PERFORM PRE AND POST EXERCISE BLOOD GAS STUDIES	19	23	25	60	79	57	100
F164 SET UP TREADMILL EQUIPMENT	33	26	50	80	93	86	100
H222 PERFORM ELECTROCARDIOGRAPH TESTS	33	42	45	73	71	57	80
F130 ADMINISTER MEDICATIONS	75	52	80	80	93	100	100
E127 PERFORM RECEPTIONIST FUNCTIONS, SUCH AS ANSWERING PHONE AND RECEIVING PATIENTS	83	55	65	80	93	86	100
F136 CALIBRATE BLOOD GAS ANALYZERS	89	36	35	87	64	71	80
F135 CALCULATE RESULTS OF BLOOD GAS ANALYSIS	83	36	50	87	79	71	100
J277 ASSIST PHYSICIAN IN THE PERFORMANCE OF BRONCHOSCOPIES	53	16	15	13	7	71	100
K317 PASTEURIZE NONDISPOSABLE RESPIRATORY EQUIPMENT COMPONENTS	53	16	15	7	29	29	100
H238 SET UP HOLTER-MONITORING SCANNERS	25	19	20	73	14	57	100
F144 MONITOR PATIENTS WHILE TRANSPORTING WITHIN THE HOSPITAL	22	23	35	27	43	57	100
J273 ADJUST OXYGEN BLENDER SETTINGS	67	36	60	20	64	71	100
E98 MAKE ENTRIES ON AF FORM 578 (DATA RECORD)	33	23	40	13	36	43	60
H196 ASSESS AND REPORT TO PHYSICIAN ECHOCARDIOGRAM TEST RESULTS	33	19	30	40	7	57	100
H223 PERFORM M-MODE ECHOCARDIOGRAMS	36	16	30	53	14	57	100
F141 DISPOSE OF CONTAMINATED MATERIALS	39	32	30	53	86	57	47
D65 CONDUCT TRAINING CONFERENCES OR BRIEFINGS	33	29	10	20	64	43	40
F151 PERFORM CO OXIMETER TESTS	56	19	10	7	0	86	0
F137 CALIBRATE CO OXIMETERS	56	23	5	27	0	86	0
D63 CONDUCT PHASE II TRAINING	53	32	5	27	0	100	0
F152 PERFORM OXIMETER TESTS	36	19	25	7	14	100	0
P62 CONDUCT OJT	44	29	45	20	43	86	20
G190 SET UP STERILE FIELD	19	19	20	7	14	43	0
G173 ASSIST PHYSICIAN IN INSERTIONS OF HEART CATHETERS	8	23	20	0	0	0	0

COMPARISON OF 90251 CONUS AND OVERSEAS GROUPS

Many times, the technical job performed in an Air Force specialty differs between continental United States (CONUS) and overseas assignments. To isolate how the technical job changes between CONUS and overseas assignments, all 5-skill level personnel who indicate a CONUS assignment are compared to those who report an overseas assignment. In the 902X1 career ladder, this comparison identified several differences.

Eight DAFSC 90251 personnel indicated an assignment overseas. Compared to the 54 DAFSC 90251 respondents assigned in the CONUS, the overseas specialists performed a broader job; Table 21 reveals that the CONUS specialists averaged the performance of 83 tasks, whereas the overseas specialists averaged the performance of 111 tasks. Table 22 reinforces this by illustrating that the tasks which best differentiate the CONUS and overseas groups tend to be those tasks performed by a higher percentage of the overseas group.

The reason the 5-skill level job is broader overseas could be due to the organizational level of respondents in each group. As Table 21 shows, the CONUS 5-skill levels are most concentrated in the Medical Centers, where specialization is more likely; the overseas 5-skill level group, on the other hand, has a higher percentage of members assigned to hospitals and regional hospitals.

Some equipment utilization differences were found between CONUS and overseas groups (see Table 21). Once again, however, this could be due to the type of facility to which the incumbents are assigned; as indicated in the table, most differences in equipment utilization indicate utilization by a higher percentage of the overseas group.

In summary, differences in job performance exist between 90251 CONUS and overseas personnel. The main gist of these differences centers around a broader job for the overseas personnel. Very likely, this is due to a higher percentage of overseas versus CONUS personnel in hospitals and regional hospitals with CONUS personnel more concentrated in the medical centers, which are more likely to employ specialization in one or several of the 902X1 functional areas.

TABLE 21
BACKGROUND COMPARISON OF 90251 CONUS TO OVERSEAS GROUPS

	90251 CONUS PERSONNEL	90251 OVERSEAS PERSONNEL
NUMBER OF MEMBERS:	54	8
AVERAGE NUMBER OF TASKS PERFORMED:	83	111
JOB DIFFICULTY INDEX:	11.1	13.8
PERCENT SUPERVISING OTHERS:	19%	25%
<u>ORGANIZATIONAL LEVEL (PERCENT RESPONDING):</u>		
CLINIC	9%	0%
HOSPITAL	5%	24%
MEDICAL CENTER	67%	38%
REGIONAL HOSPITAL	19%	38%
<u>AREAS WORKED IN WITHIN THE LAST YEAR (PERCENT RESPONDING):</u>		
INVASIVE CARDIOLOGY	11%	0%
NONINVASIVE CARDIOLOGY	50%	75%
PULMONARY	44%	88%
RESPIRATORY THERAPY	83%	100%
<u>DIFFERENTIATING EQUIPMENT UTILIZATION (PERCENT RESPONDING):</u>		
BLOOD GAS ANALYZERS	74%	100%
CAMERAS	22%	0%
CARDIAC OUTPUT RECORDERS	15%	38%
COMPRESSORS	65%	88%
COMPUTER TERMINALS	44%	25%
CO OXIMETERS	32%	0%
DEFIBRILLATORS	54%	88%
DIFFUSING CAPACITY MEASURE	24%	63%
ECHOCARDIOGRAPHY SYSTEMS (M-MODE)	26%	88%
ELECTROCARDIOGRAPHIC MACHINE	46%	88%
HAND HELD NEBULIZERS	82%	100%
HOLTER MONITOR EQUIPMENT (NOT SCANNERS)	30%	75%
OSCILLOSCOPES	32%	63%
TREADMILLS	43%	88%

TABLE 22

TASKS WHICH BEST DIFFERENTIATE DAFSC 90251 CONUS AND OVERSEAS GROUPS
(PERCENT MEMBERS PERFORMING)

TASKS	CONUS (N=54)	OVERSEAS (N=8)
H196 ASSESS AND REPORT TO PHYSICIAN ECHOCARDIOGRAM TEST RESULTS	26	88
H211 INSTRUCT PATIENTS IN ECHOCARDIOGRAPHY PROCEDURES	26	88
H223 PERFORM M-MODE ECHOCARDIOGRAMS	26	88
H230 PREPARE PATIENTS FOR ECHOCARDIOGRAMS	26	88
H236 SET UP ECHOCARDIOGRAPH MACHINES	26	88
E117 MAKE ENTRIES ON SF FORM 520 (CLINICAL RECORD-ELECTROCARDIOGRAPHIC RECORD)	28	88
I248 CALCULATE RESULTS OF SPIROMETRY TESTS	28	88
I265 PERFORM PRE AND POST EXERCISE BLOOD GAS STUDIES	30	88
E109 MAKE ENTRIES ON LOCAL PULMONARY REQUEST FORMS	33	88
I267 PERFORM ROUTINE SPIROMETRY	33	88
J296 PERFORM PRETREATMENT EVALUATION OF RESPIRATORY THERAPY PATIENTS	33	88
F143 INSTRUCT PATIENTS IN TREADMILL TEST PROCEDURES	35	88
F155 PREPARE PATIENTS FOR TREADMILL TESTS	35	88
H216 MONITOR ECGs	36	88
E105 MAKE ENTRIES ON LOCAL ECHOCARDIOGRAPHIC RECORD FORMS	24	75
E111 MAKE ENTRIES ON LOCAL TREADMILL REPORT FORMS	37	88
H210 INSTRUCT PATIENTS IN ECG PROCEDURES	37	88
H193 ADJUST ELECTROCARDIOGRAPH (ECG) MACHINES	39	88
H222 PERFORM ELECTROCARDIOGRAPH TESTS	39	88
F146 MOUNT RESULTS OF TREADMILL TESTS	28	75
F164 SET UP TREADMILL EQUIPMENT	41	88
H229 PREPARE PATIENTS FOR ECGs	41	88
F163 SET UP SPIROMETERS	43	88
F167 TAKE AND RECORD BLOOD PRESSURES	43	88
J289 MONITOR INTERMITTENT POSITIVE PRESSURE BREATHING (IPPB) TREATMENTS	31	75
J303 SET UP IPPB EQUIPMENT	44	88
F140 COMPILE PHYSIOLOGICAL DATA FOR COMPUTER INPUT	39	0
D63 CONDUCT PHASE II TRAINING	35	0

EXAMINATION OF AFS 902X1 JOB ATTITUDES

Along with task data, USAF Job Inventories include several standard questions concerning job attitudes. These questions address how interesting incumbents find their job, whether their job well utilizes their talents and training, the sense of accomplishment generated in their job, and their reenlistment intentions. Comparing job attitudes by experience groups enables assessment of how career ladder incumbents perceive their job as they progress in their career. This can help identify problem areas in a career field. For example, poor reenlistment intentions in a group may foretell future manning shortages. At the time of survey administration, very few 90251 members were in their first Air Force enlistment. Consequently, examination of job attitudes by time in career field (TICF) groups better depicts changes with experience.

For purposes of comparison, job attitude data for similar career ladders surveyed in 1982 was compiled. This data allows a relative assessment of how 902X1 members judge the cardiopulmonary career ladder, compared to how members of similar career ladders judge their respective specialties. For this comparison, a combination of all of the lateral career ladders surveyed in 1982 was used for comparative data. Though the 902X1 career ladder is not presently lateral, at the time of this survey, 902X1 demographics most closely paralleled a lateral organization.

Table 23 presents 902X1 and comparative job attitude information. As indicated, 902X1 personnel rate their job more positively than their respective comparative counterparts on all of the questions. Within the 902X1 specialty, job attitudes do not appear to greatly vary with experience. All experience groups report positive attitudes on all of the questions.

In conclusion, most incumbents in AFS 902X1 report satisfaction with their specialty. They rate their ladder more positively than do persons in similarly structured career ladders.

TABLE 23

JOB ATTITUDE DATA FOR EXPERIENCE GROUPS AND COMPARATIVE SAMPLE* PERSONNEL
(PERCENT MEMBERS PERFORMING)

JOB ATTITUDES	1-48 MONTHS TICF**		46-96 MONTHS TICF**		97+ MONTHS TICF**	
	902X1 (N=59)	1982 COMP* SAMPLE (N=271)	902X1 (N=41)	1982 COMP* SAMPLE (N=130)	902X1 (N=39)	1982 COMP* SAMPLE (N=164)
<u>I FIND MY JOB:</u>						
DULL	10	21	10	18	8	15
SO-SO	12	15	2	10	5	16
INTERESTING	76	63	85	72	82	68
<u>MY JOB UTILIZES MY TALENTS:</u>						
NOT AT ALL TO VERY LITTLE	24	30	24	28	15	27
FAIRLY WELL OR BETTER	75	69	73	82	85	73
<u>MY JOB UTILIZES MY TRAINING:</u>						
NOT AT ALL TO VERY LITTLE	24	37	24	36	18	28
FAIRLY WELL OR BETTER	73	63	71	64	82	72
<u>WITH SENSE OF ACCOMPLISHMENT, I AM:</u>						
DISSATISFIED	24	30	20	34	10	26
AMBIVALENT	5	16	7	6	8	7
SATISFIED	70	54	68	60	80	67
<u>I PLAN TO REENLIST:</u>						
I PLAN TO RETIRE	2	5	12	15	18	37
NO, OR PROBABLY NO	20	29	7	13	10	12
YES, OR PROBABLY YES	76	65	81	71	72	52

NOTE: QUESTION COLUMNS MAY NOT ADD TO 100 PERCENT DUE TO NO RESPONSE BY SOME RESPONDENTS.

* 1982 COMPARATIVE SAMPLE IS COMPRISED OF ALL LATERAL CAREER LADDERS SURVEYED IN 1982.

** TICF = TIME IN CAREER FIELD

ANALYSIS OF 902X1 WRITE-IN COMMENTS

At the back of each occupational inventory, respondents are encouraged to write any comments they have about the inventory or the career field. When reading these comments during survey analysis, the analyst seeks any thread of commonality among the comments. These can reflect on training, classification, utilization, or they can indicate areas where the survey instrument can be improved.

The write-in comments from the 902X1 survey did not indicate any prevalent common concerns in the career ladder. Two members felt that performing both cardiology and pulmonary functions is too much for a single technician; thus, these duties should be separated. Another write-in comment indicated that invasive cardiology should not be mandatory in Phase II structured training, since all Phase II sites do not perform invasive cardiology.

In all, based on the write-in comments, 902X1 career ladder members do not have any major recommendations for career ladder change, nor do they have any major complaints.

IMPLICATIONS

The job of 902X1 personnel varies around the performance of tasks related to four areas: invasive cardiology, noninvasive cardiology, pulmonary, and respiratory therapy. Personnel assigned to the medical centers are likely to specialize in one or two of these areas, while those assigned to the smaller clinics, hospitals, and regional hospitals may perform tasks in several areas. Invasive Cardiology seems a very specialized job performed almost exclusively by a small group of incumbents.

The AFR 39-1 Specialty Job Description for the 1-, 3-, and 5-skill level personnel seems shallow; including some additional tasks and equipment items might help it to better present the range of 5-skill level responsibilities. Both the 902X1 STS and POI need review. One item of the STS and 16 paragraphs of the POI surfaced for evaluation by 902X1 training officials. In addition, several tasks need review for possible expansion of the STS and POI.

Some differences in job performance were found between major commands. These job differences should be considered when examining training so as not to eliminate training which may be essential to a major command. TAC personnel reported especially low job satisfaction. SAC, ATC, and AFSC had lower than average opinions of how their training is presently utilized on their job.

In summary, the 902X1 career ladder is diverse. This report recommends review of the 1-, 3-, 5-skill level AFR 39-1 and review of the STS and POI, in light of this occupational survey data.

APPENDIX A

TABLE A1
 REPRESENTATIVE TASKS PERFORMED BY
 RESIPRATORY THERAPY PERSONNEL
 (N=27)

TASKS	PERCENT MEMBERS PERFORMING
J304 SET UP OXYGEN THERAPY DEVICES, SUCH AS OXYGEN MASKS, ISOLETTES, OR CANNULAS	100
J307 SET UP STANDARD HUMIDIFIERS	96
J308 SET UP STANDARD NEBULIZERS	96
J281 CONNECT FLOWMETERS	93
K312 ASSEMBLE OR DISASSEMBLE NON-DISPOSABLE RESPIRATORY EQUIPMENT COMPONENTS	89
J310 SET UP VENTILATORS	85
J275 ADJUST VENTILATOR SETTINGS	85
K313 CHANGE RESPIRATORY EQUIPMENT COMPONENTS	81
J273 ADJUST OXYGEN BLENDER SETTINGS	81
J291 OPERATE MECHANICAL VENTILATION DEVICES, SUCH AS IPPB OR VOLUME VENTILATORS	81
F130 ADMINISTER MEDICATIONS	81
J306 SET UP RESPIRATORY THERAPY ALARMS	81
J302 SET UP INTERMITTENT MANDATORY VENTILATION (IMV) DEVICES	81
J305 SET UP POSITIVE END EXPIRATORY PRESSURE (PEEP) DEVICES	81
J280 CALIBRATE OXYGEN ANALYZERS	81
J301 SET UP CONTINUOUS POSITIVE AIRWAY PRESSURE (CPAP) DEVICES	81
J299 PERFORM SUCTIONING PROCEDURES	81
K315 DISINFECT NON-DISPOSABLE RESPIRATORY EQUIPMENT COMPONENTS	78
E108 MAKE ENTRIES ON LOCAL FORMS FOR VENTILATION SETTINGS	78
J286 INSTRUCT PATIENTS IN USE OF HAND-HELD OR UPDRAFT NEBULIZERS	74
J283 INSTRUCT PATIENT IN USE OF INCENTIVE SPIROMETRY	74
E106 MAKE ENTRIES ON LOCAL FORMS FOR ARTERIAL BLOOD GAS ANALYSTS	74
F148 PERFORM ARTERIAL PUNCTURES	74
J274 ADJUST RESPIRATORY THERAPY ALARMS	70
J311 WEAN PATIENTS FROM VENTILATORS	70

TABLE A2
REPRESENTATIVE TASKS PERFORMED BY
RESPIRATORY THERAPY TECHNICIAN-SUPERVISORS
(N=8)

TASKS	PERCENT MEMBERS PERFORMING
C47 EVALUATE QUALITY OF PATIENT CARE	100
E106 MAKE ENTRIES ON LOCAL FORMS FOR ARTERIAL BLOOD GAS ANALYSIS	100
K313 CHANGE RESPIRATORY EQUIPMENT COMPONENTS	100
J310 SET UP VENTILATORS	100
J311 WEAN PATIENTS FROM VENTILATORS	100
K312 ASSEMBLE OR DISASSEMBLE NON-DISPOSABLE RESPIRATORY EQUIPMENT COMPONENTS	100
E108 MAKE ENTRIES ON LOCAL FORMS FOR VENTILATION SETTINGS	100
J300 RECORD PROGRESS OF RESPIRATORY THERAPY TREATMENT	100
F136 CALIBRATE BLOOD GAS ANALYZERS	100
F130 ADMINISTER MEDICATIONS	100
J286 INSTRUCT PATIENTS IN USE OF HAND-HELD OR UPDRAFT NEBULIZERS	100
F148 PERFORM ARTERIAL PUNCTURES	100
J288 MONITOR BRONCHIAL DIALATOR THERAPY	100
J304 SET UP OXYGEN THERAPY DEVICES, SUCH AS OXYGEN MASKS, TENTS, ISOLETES, OR CANNULAS	100
J291 OPERATE MECHANICAL VENTILATION DEVICES, SUCH AS IPPB OR VOLUME VENTILATORS	100
B31 INVENTORY EQUIPMENT, TOOLS, OR SUPPLIES	100
J302 SET UP INTERMITTENT MANDATORY VENTILATION (IMV) DEVICES	100
J305 SET UP POSITIVE END EXPIRATORY PRESSURE (PEEP) DEVICES	100
J274 ADJUST RESPIRATORY THERAPY ALARMS	100
J306 SET UP RESPIRATORY THERAPY ALARMS	100
K319 REMOVE OR REPLACE COMPONENTS, SUCH AS ELECTRODES, FILTERS, GASKETS, FUSES, OR BULBS, ON CARDIOPULMONARY EQUIPMENT	100
C55 PREPARE APRs	100
B21 COUNSEL PERSONNEL ON PERSONAL OR MILITARY-RELATED PROBLEMS	100
A9 ESTABLISH ORGANIZATIONAL POLICIES, OFFICE OR LABORATORY INSTRUCTIONS, OR STANDING OPERATING PROCEDURES (SOP)	100
J296 PERFORM PRETREATMENT EVALUATION OF RESPIRATORY THERAPY PATIENTS	100

TABLE A3
REPRESENTATIVE TASKS PERFORMED BY
GENERAL CARDIOPULMONARY LABORATORY PERSONNEL
(N=50)

TASKS	PERCENT MEMBERS PERFORMING
E106 MAKE ENTRIES ON LOCAL FORMS FOR ARTERIAL BLOOD GAS ANALYSIS	100
I267 PERFORM ROUTINE SPIROMETRY	98
E127 PERFORM RECEPTIONIST FUNCTIONS, SUCH AS ANSWERING PHONE AND RECEIVING PATIENTS	98
J286 INSTRUCT PATIENTS IN USE OF HAND-HELD OR UPDRAFT NEBULIZERS	98
J291 OPERATE MECHANICAL VENTILATION DEVICES, SUCH AS IPPB OR VOLUME VENTILATORS	98
J275 ADJUST VENTILATOR SETTINGS	98
J310 SET UP VENTILATORS	98
F130 ADMINISTER MEDICATIONS	98
F167 TAKE AND RECORD BLOOD PRESSURES	98
F148 PERFORM ARTERIAL PUNCTURES	96
K316 INSPECT CARDIOPULMONARY EQUIPMENT	96
F131 ASSEMBLE EQUIPMENT FOR BLOOD GAS STUDIES	96
F164 SET UP TREADMILL EQUIPMENT	96
J304 SET UP OXYGEN THERAPY DEVICES, SUCH AS OXYGEN MASKS, TENTS, ISOLETTES, OR CANNULAS	96
E89 MAINTAIN PATIENT APPOINTMENT BOOKS	94
K312 ASSEMBLE OR DISASSEMBLE NON-DISPOSABLE RESPIRATORY EQUIPMENT COMPONENTS	94
J274 ADJUST RESPIRATORY THERAPY ALARMS	94
J283 INSTRUCT PATIENT IN USE OF INCENTIVE SPIROMETRY	94
E109 MAKE ENTRIES ON LOCAL PULMONARY REQUEST FORMS	92
E111 MAKE ENTRIES ON LOCAL TREADMILL REPORT FORMS	92
H210 INSTRUCT PATIENTS IN ECG PROCEDURES	92
F149 PERFORM BLOOD GAS ANALYSES OTHER THAN PRE AND POST EXERCISE STUDIES	92
F135 CALCULATE RESULTS OF BLOOD GAS ANALYSIS	92
E108 MAKE ENTRIES ON LOCAL FORMS FOR VENTILATION SETTINGS	92
J281 CONNECT FLOWMETERS	92

TABLE A4
 REPRESENTATIVE TASKS PERFORMED BY
 NON-INVASIVE CARDIOLOGY LABORATORY PERSONNEL
 (N=9)

TASKS	PERCENT MEMBERS PERFORMING
H229 PREPARE PATIENTS FOR ECGs	100
H210 INSTRUCT PATIENTS IN ECG PROCEDURES	100
E127 PERFORM RECEPTIONIST FUNCTIONS, SUCH AS ANSWERING PHONE AND RECEIVING PATIENTS	100
H208 DETERMINE LETHAL AND WARNING ARRHYTHMIAS	100
F155 PREPARE PATIENTS FOR TREADMILL TESTS	100
F167 TAKE AND RECORD BLOOD PRESSURES	100
E111 MAKE ENTRIES ON LOCAL TREADMILL REPORT FORMS	100
H222 PERFORM ELCTROCARDIOGRAPH TESTS	89
F164 SET UP TREADMILL EQUIPMENT	89
H231 PREPARE PATIENTS FOR HOLTER-MONITORING TESTS	89
F143 INSTRUCT PATIENTS IN TREADMILL TEST PROCEDURES	89
H213 INSTRUCT PATIENTS IN USE OF HOLTER-MONITORING EQUIPMENT	89
F148 PERFORM ARTERIAL PUNCTURES	89
F131 ASSEMBLE EQUIPMENT FOR BLOOD GAS STUDIES	89
H195 ASSESS AND REPORT TO PHYSICIAN ECG TEST RESULTS	78
H218 MOUNT ECG TRACINGS	78
H197 ASSESS AND REPORT TO PHYSICIAN HOLTER-MONITORING TEST RESULTS	78
H237 SET UP HOLTER-MONITORING EQUIPMENT OTHER THAN SCANNERS	78
H201 ATTACH HOLTER-MONITORING EQUIPMENT	78
F146 MOUNT RESULTS OF TREADMILL TESTS	78
H219 MOUNT HOLTER-MONITORING TRACINGS	78
F136 CALIBRATE BLOOD GAS ANALYZERS	78
E109 MAKE ENTRIES ON LOCAL PULMONARY REQUEST FORMS	78
J281 CONNECT FLOWMETERS	78

TABLE A5
REPRESENTATIVE TASKS PERFORMED BY
PULMONARY LABORATORY PERSONNEL
(N=8)

TASKS	PERCENT MEMBERS PERFORMING
I267 PERFORM ROUTINE SPIROMETRY	100
E127 PERFORM RECEPTIONIST FUNCTIONS, SUCH AS ANSWERING PHONE AND RECEIVING PATIENTS	100
F135 CALCULATE RESULTS OF BLOOD GAS ANALYSIS	100
E106 MAKE ENTRIES ON LOCAL FORMS FOR ARTERIAL BLOOD GAS ANALYSIS	100
E88 MAINTAIN GENERAL FILES, RECORDS, OR LABORATORY REPORTS	100
I261 PERFORM LUNG DIFFUSION TESTS	100
F136 CALIBRATE BLOOD GAS ANALYZERS	100
I271 SET UP LUNG DIFFUSION EQUIPMENT	100
F131 ASSEMBLE EQUIPMENT FOR BLOOD GAS STUDIES	100
F130 ADMINISTER MEDICATIONS	100
I245 CALCULATE RESULTS OF LUNG DIFFUSION TESTS	100
F163 SET UP SPIROMETERS	88
I254 INSTRUCT PATIENTS IN PERFORMANCE OF ROUTINE SPIROMETRY	88
I248 CALCULATE RESULTS OF SPIROMETRY TESTS	88
F148 PERFORM ARTERIAL PUNCTURES	88
I255 PERFORM BODY PLETHYSMOGRAPH TESTS	88
E109 MAKE ENTRIES ON LOCAL PULMONARY REQUEST FORMS	88
F147 OPERATE ELECTRONIC CALCULATORS	88
I249 INSTRUCT PATIENTS IN BODY PLETHYSMOGRAPH TESTS	88
I253 INSTRUCT PATIENTS IN LUNG DIFFUSION TESTS	88
I246 CALCULATE RESULTS OF LUNG VOLUME TESTS	88
E87 DISTRIBUTE OR FILE TEST RESULTS	88
E89 MAINTAIN PATIENT APPOINTMENT BOOKS	88
I258 PERFORM FLOW VOLUME LOOP TESTS	75
I251 INSTRUCT PATIENTS IN FLOW VOLUME LOOP TEST PROCEDURES	75

TABLE A6
 REPRESENTATIVE TASKS PERFORMED BY
 NON-INVASIVE CARDIOLOGY TECHNICIAN-SUPERVISORS
 (N=10)

TASKS	PERCENT MEMBERS PERFORMING
H230 PREPARE PATIENTS FOR ECHOCARDIOGRAMS	100
E89 MAINTAIN PATIENT APPOINTMENT BOOKS	100
A4 DETERMINE WORK PRIORITIES	100
H231 PREPARE PATIENTS FOR HOLTER-MONITORING TESTS	100
H233 SCAN HOLTER-MONITORING TAPES FOR ABNORMALITIES	100
H201 ATTACH HOLTER-MONITORING EQUIPMENT	100
H197 ASSESS AND REPORT TO PHYSICIAN HOLTER-MONITORING TEST RESULTS	100
F164 SET UP TREADMILL EQUIPMENT	100
H210 INSTRUCT PATIENTS IN ECG PROCEDURES	100
E105 MAKE ENTRIES ON LOCAL ECHOCARDIOGRAPHIC RECORD FORMS	100
H223 PERFORM M-MODE ECHOCARDIOGRAMS	90
H226 PERFORM TWO-DIMENSIONAL ECHOCARDIOGRAMS	90
H211 INSTRUCT PATIENTS IN ECHOCARDIOGRAPHY PROCEDURES	90
E111 MAKE ENTRIES ON LOCAL TREADMILL REPORT FORMS	90
H196 ASSESS AND REPORT TO PHYSICIAN ECHOCARDIOGRAM TEST RESULTS	90
E88 MAINTAIN GENERAL FILES, RECORDS, OR LABORATORY REPORTS	90
H195 ASSESS AND REPORT TO PHYSICIAN ECG TEST RESULTS	90
H237 SET UP HOLTER-MONITORING EQUIPMENT OTHER THAN SCANNERS	90
H222 PERFORM ELECTROCARDIOGRAPH TESTS	90
H213 INSTRUCT PATIENTS IN USE OF HOLTER-MONITORING EQUIPMENT	90
H238 SET UP HOLTER-MONITORING SCANNERS	90
H229 PREPARE PATIENTS FOR ECGs	90
E127 PERFORM RECEPTIONIST FUNCTIONS, SUCH AS ANSWERING PHONE AND RECEIVING PATIENTS	80
H236 SET UP ECHOCARDIOGRAPH MACHINES	80
A3 COORDINATE WORK ACTIVITIES WITH OTHER SECTIONS	80

TABLE A7
REPRESENTATIVE TASKS PERFORMED BY
LABORATORY NCOICs
(N=10)

TASKS	PERCENT MEMBERS PERFORMING
B21 COUNSEL PERSONNEL ON PERSONAL OR MILITARY-RELATED PROBLEMS	100
B30 INTERPRET POLICIES, DIRECTIVES, OR PROCEDURES FOR SUBORDINATES	100
A2 ASSIGN SPONSORS FOR NEWLY ASSIGNED PERSONNEL	100
B38 WRITE CORRESPONDENCE	90
A9 ESTABLISH ORGANIZATIONAL POLICIES, OFFICE OR LABORATORY INSTRUCTIONS, OR STANDING OPERATING PROCEDURES (SOP)	90
C39 ANALYZE WORK LOAD REQUIREMENTS	90
A4 DETERMINE REQUIREMENTS FOR SPACE, PERSONNEL, EQUIPMENT, OR SUPPLIES	90
A3 COORDINATE WORK ACTIVITIES WITH OTHER SECTIONS	90
C41 EVALUATE COMPLIANCE WITH PERFORMANCE STANDARDS	90
A19 SCHEDULE LEAVES OR PASSES	90
C42 EVALUATE INDIVIDUALS FOR PROMOTION, DEMOTION, OR RECLASSIFICATION	90
A5 DETERMINE WORK PRIORITIES	80
D67 COUNSEL TRAINEES ON TRAINING PROGRESS	80
A1 ASSIGN PERSONNEL TO DUTY POSITIONS	80
B20 CONDUCT STAFF MEETINGS	80
A17 PREPARE JOB DESCRIPTIONS	80
A6 DEVELOP ORGANIZATIONAL CHARTS	80
D60 ASSIGN ON-THE-JOB TRAINING (OJT) TRAINERS	80
C56 PREPARE RECOMMENDATIONS FOR AWARDS OR INDIVIDUAL RECOGNITION	80
C44 EVALUATE JOB DESCRIPTIONS	80
B31 INVENTORY EQUIPMENT, TOOLS, OR SUPPLIES	80
A10 ESTABLISH PERFORMANCE STANDARDS FOR SUBORDINATES	70
B22 DIRECT DEVELOPMENT OR MAINTENANCE OF STATUS BOARDS, GRAPHS, OR CHARTS	70
C52 EVALUATE WORK SCHEDULES	70
C55 PREPARE APRs	70

TABLE A8
REPRESENTATIVE TASKS PERFORMED BY
CARDIO-CATHETERIZATION LABORATORY PERSONNEL
(N=7)

TASKS	PERCENT MEMBERS PERFORMING
E126 OPERATE COMPUTER TERMINAL	100
F156 RECORD DATA FROM PHYSIOLOGICAL MONITORS	100
G190 SET UP STERILE FIELD	100
G177 COMPLETE LOCAL PROTOCOL FORMS FOR CATHETERIZATION PROCEDURES	100
F140 COMPILE PHYSIOLOGICAL DATA FOR COMPUTER INPUT	100
F166 SET UP X-RAY EQUIPMENT	100
G175 ATTACH ELECTROCARDIOGRAPH (ECG) LEADS TO PHYSIOLOGICAL MONITORING DEVICES	100
G191 SET UP THERMODILUTION INJECTORS OR SYRINGES	100
G180 INSTRUCT PATIENTS IN CATHETERIZATION PROCEDURES	100
G182 MIX HEPARINIZED FLUSH SOLUTIONS	100
E104 MAKE ENTRIES ON LOCAL CARDIAC CATHETERIZATIONS OR HEMODYNAMICS FORMS	100
G178 CONNECT TRANSDUCERS TO PRESSURE LINES	100
F165 SET UP VIDEO EQUIPMENT	100
G173 ASSIST PHYSICIAN IN INSERTIONS OF HEART CATHETERS	100
G179 CONNECT TRANSDUCERS TO SWAN-GANZ CATHETERS	100
G169 ADJUST TEMPORARY PACEMAKER SETTINGS	100
F138 CALIBRATE OXIMETERS	100
F150 PERFORM CARDIOPULMONARY RESUSCITATION (CPR)	100
F161 SET UP PHYSIOLOGICAL RECORDING MONITORS	86
G187 SET UP CARDIAC CATHETERIZATION TRAYS	86
G184 PREPARE SITE FOR CATHETER INSERTIONS	86
G176 CALCULATE RESULTS OF CATHETERIZATION PROCEDURES	86
G170 APPLY DIRECT PRESSURE TO CATHETERIZATION INJECTION SITES	86
F158 SET UP OSCILLOSCOPES	86
E107 MAKE ENTRIES ON LOCAL FORMS FOR ITEMS SENT TO BE STERILIZED	86

